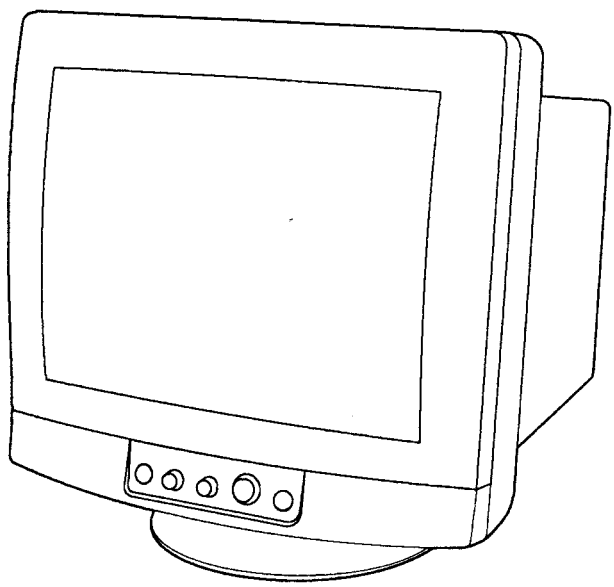
Service Manual

Nokia Display Products Oy
P.O.Box 14
FIN–24101 Salo, Finland

Chassis 446A

19"High Resolution Color Monitor



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Level	1	2
Main Board module	SMA209G	SMA217B
CRT module	SMH148C	SMH148E
Video amplifier module ...	SMY042C	SMY042E

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Service

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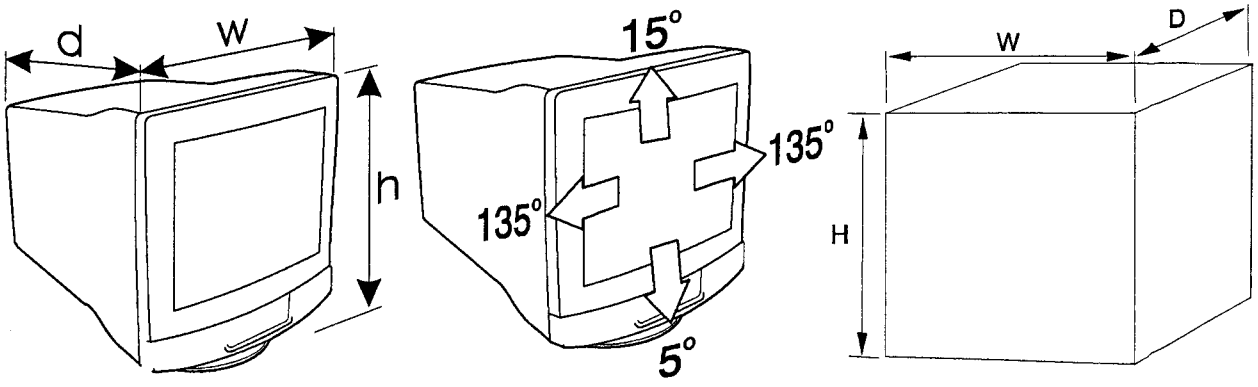
1. Product Overview

446A is a 19 inch monitor. The maximum resolution of 1600 x 1280 makes the monitor suitable for PC applications using graphical user interfaces. The monitor has an own power supply with input voltage requirements from 90V to 264V.

1.1. Technical Specifications

Cathode Ray Tube	19" in diagonal, 90° deflection angle Dark, non-glare, antistatic coating Short persistence (P22) Dot pitch 0.26 mm
Picture Size	354 mm x 265 mm with specified geometric distortion
Maximum Picture Size	mm x mm, diagonally 449,7 mm (17.7")
Power Input Requirements	Voltage 90-264 V, 50/60 Hz Autosense Current 2.3 A/110 V, 1.1 A/240 V
Power Dissipation	< 160 W Normal Operation ~70 W Stand-by < 30 W Suspend < 5 W Auto power off
Memory Locations	15 for factory preset timings 6 for user adjusted timings
Geometric Distortion	The distance between bezel and active screen edge shall not vary more than 2 mm in both vertical and horizontal dimensions
Luminance	Min. 70 cdm^{-2} at center, with full white field
Video Input	Input Signal: RGB, analog, positive, max 0.7 V/75 Ω Horizontal addressability: 1600 dots maximum Vertical addressability: 1280 dots maximum
Synchronization Range ...	Horizontal: 30 kHz to 107 kHz automatic Vertical: 50 Hz to 150 Hz automatic
Synchronization Signal	Separate TTL, positive/negative Composite TTL, positive/negative Composite, on green 0.3 Vpp negative
Max. Dot Frequency Capability	230 MHz
Temperature	Operating: +10°C to +40°C Packed: -20°C to +60°C
Humidity	Operating: 15% to 85 % Packed: 5% to 95 %
Weight	31 kg net 36 kg gross

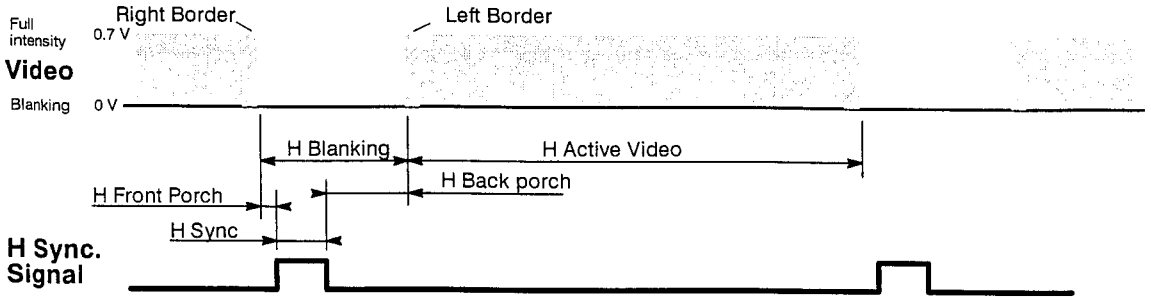
Size, Tilt and Swivel

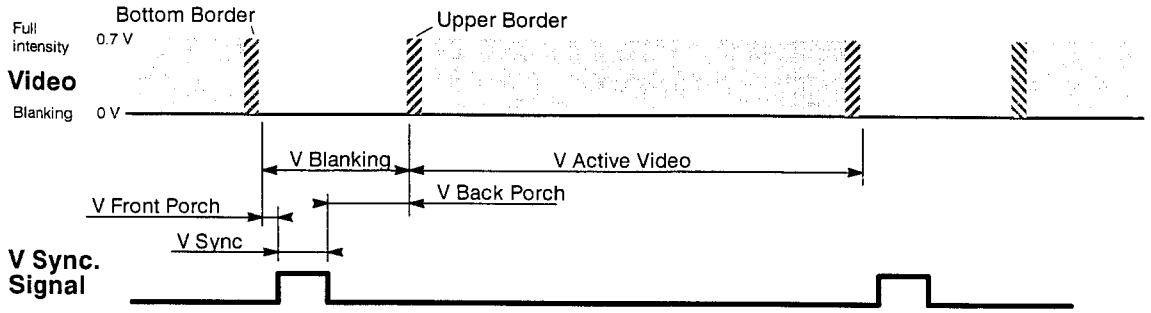


Dimensions

Monitor	h	450 mm
	w	464 mm
	d	473 mm
Package	H	670 mm
	W	670 mm
	D	740 mm

1.2. Preset Display Modes





Memory location–>	0	1	2	3	4	5	6	7	8
Display Mode Name	GTF790	NCE300	NCE406	NCE321G	NCE513	NCE612	NCE013	NCE605	NCE70X
H Frequency/kHz	107.101	31.472	46.875	35.000	68.677	91.146	77.494	79.976	93.755
H Period/µs	9.337	31.774	21.333	28.571	14.561	10.971	12.904	12.504	10.666
H Active Video/µs	6.815	25.420	16.162	21.164	10.836	8.127	9.481	9.481	7.901
H Resolution	1600	640	800	640	1024	1280	1152	1280	1600
H Sync/µs	0.750	3.81	1.616	2.12	1.02	1.02	1.05	1.062	0.948
H Back Porch/µs	1.261	1.91	3.232	3.17	2.20	1.52	1.84	1.043	1.501
V Frequency/Hz	85.0	59.9	75	66.7	85.0	85.0	85.1	75	75.0
V Period/Lines	1260	525	625	525	808	1072	911	1066	1250
V Resolution	1200	480	600	480	768	1024	864	1024	1200
V Sync/Lines	3	2	3	3	3	3	3	3	3
V Back Porch/ Lines	56	33	21	39	36	44	43	38	46
H sync Polarity	–	–	+	N/A	+	+	+	+	+
V sync Polarity	+	–	+	N/A	+	+	+	+	+
H Front Porch/µs	0.51	0.64	0.32	2.12	0.51	0.31	0.53	0.12	0.32
V Front Porch/ Lines	1	10	1	3	1	1	1	1	1
Dot Frequency/ MHz	234.776	25.177	49.500	30.240	94.500	157.500	121.510	135.640	202.510
Interlacing	no	no	no	no	no	no	no	no	no

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1.3. S–Capacitor table

F/kHz	PA7	PA6	PA5	PA4	PA3	PA2	PA1	PA0	C1 Lin	C2 Lin
	0	0	0	0	0	0	0	0	0	0
105.60										
	0	0	0	0	0	0	0	1	0	0
101.40										
	0	0	0	0	0	0	1	0	1	0
97.20										
	0	0	0	0	0	0	1	1	1	0
93.00										
	0	0	0	0	0	1	0	0	1	0
90.20										
	0	0	0	0	0	1	0	1	1	0
87.40										
	0	0	0	0	0	1	1	0	1	0
84.60										
	0	0	0	0	0	1	1	1	1	0
81.80										
	0	0	0	0	1	0	0	0	0	1
79.00										
	0	0	0	0	1	0	0	1	0	1
76.20										
	0	0	0	0	1	0	1	0	0	1
73.40										
	0	0	0	0	1	0	1	1	0	1
70.60										
	0	0	0	0	1	1	0	0	0	1
67.80										
	0	0	0	0	1	1	0	1	0	1
65.80										
	0	0	0	0	1	1	1	0	0	1
64.8										
	0	0	0	0	1	1	1	1	0	1
61.9										
	0	0	0	1	0	0	0	0	0	1
60.10										
	0	0	0	1	0	0	1	0	0	1
58.30										
	0	0	0	1	0	1	0	0	0	1
56.50										
	0	0	0	1	0	1	1	0	0	1
54.70										
	0	0	0	1	1	0	0	0	1	1
52.90										
	0	0	0	1	1	0	1	0	1	1
51.10										
	0	0	0	1	1	1	0	0	1	1
49.30										

F/kHz	PA6	PA6	PA5	PA4	PA3	PA2	PA1	PA0	C1 Lin	C2 Lin
49.30										
	0	0	0	1	1	1	1	0	1	1
47.80										
	0	0	1	0	0	0	0	0	1	1
46.3										
	0	0	1	0	0	1	0	0	1	1
45.10										
	0	0	1	0	1	0	0	0	1	1
43.90										
	0	0	1	0	1	1	0	0	1	1
42.70										
	0	0	1	1	0	0	0	0	1	1
41.50										
	0	0	1	1	0	1	0	0	1	1
40.30										
	0	0	1	1	1	0	0	0	1	1
39.30										
	0	0	1	1	1	1	0	0	1	1
38.30										
	0	1	0	0	0	0	0	0	1	1
37.40										
	0	1	0	0	0	1	0	0	1	1
36.6										
	0	1	0	0	1	0	0	0	1	1
35.80										
	0	1	0	0	1	1	0	0	1	1
35.00										
	0	1	0	1	0	1	0	0	1	1
33.40										
	0	1	0	1	1	0	0	0	1	1
32.60										
	0	1	0	1	1	1	0	0	1	1
31.80										
	0	1	1	0	0	0	0	0	1	1
31.00										
	0	1	0	0	0	1	0	0	1	1
29.20										
	0	1	0	0	1	0	0	0	1	1
28.40										
	0	1	0	0	1	1	0	0	1	1
27.60										
	1	1	1	1	1	1	1	1	1	1
10.00										

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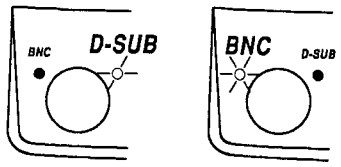
1.4. Monitor Connecton

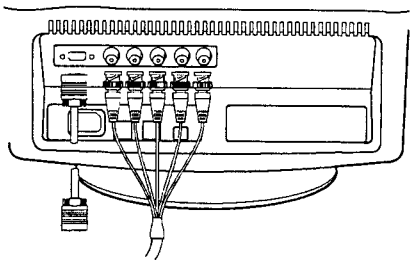
Make sure that the monitor is disconnected from mains and the power switches of the computer and all attached devices are turned off before connecting the monitor.

This monitor can be connects to the computer via D–SUB or BNC connectors. They allowed connection of the monitor to two signal sources at the same time.

The displayed signal can be selected by pushing the button in font panel.



- Connect the signal cable plug to the videocontroller connector at the back of the computer.
- Tighten the screws on the plug by hand.
- Connect the power cord first to the monitor and then to a grounded power outlet.



If your monitor is DDC compatible (PC)

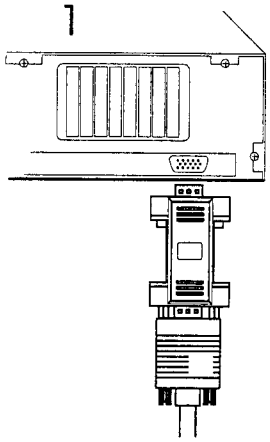
- Do not use any adapter when connecting signal cable to your computer.
- Do not extend the signal cable with extension lead. The DDC signals will not accept extended cable.

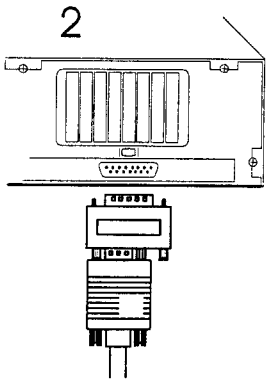
If there is no DDC in your computer (PC)

- Normally there is no need for adaptor when connecting signal cable to your computer.

1. Use a XGA–2 adaptor (QK1511) in the signal cable if you are going to use XGA–2 display mode (1024 x 768, 75 Hz)
2. Use MAC adaptor (QK1518) in signal cable when connecting the monitor to an Apple Macintosh computer.

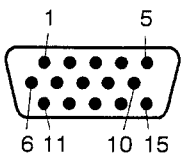
   If the computer is equipped with separate display adapter card. It may have a standard D–SUB connector. In that case Mac adaptor is not needed.





Signal connector

Pin		*Signal*	
1	–>	*RV*	*Red video*
2	–>	*GV*	*Green video*
3	–>	*BV*	*Blue video*
4	<–	*ID2*	*ID2 (tied to LG with 332 ohms inside monitor)*
5		*ST*	*DDC GND*
6		*RG*	*Red ground*
7		*GG*	*Green ground*
8		*BG*	*Blue ground*
9	–>		*Not connected*
10		*LG*	*Logic ground*
11	<–	*ID0*	*ID0 (tied to LG with 332 ohms inside monitor)*
12	<–	*SDA*	*DDC SDA*
13	–>	*Hs*	*Hor. sync., Comp. sync.*
14	–>	*Vs*	*Vert. sync.*
15	<–	*SCL*	*DDC SCL*



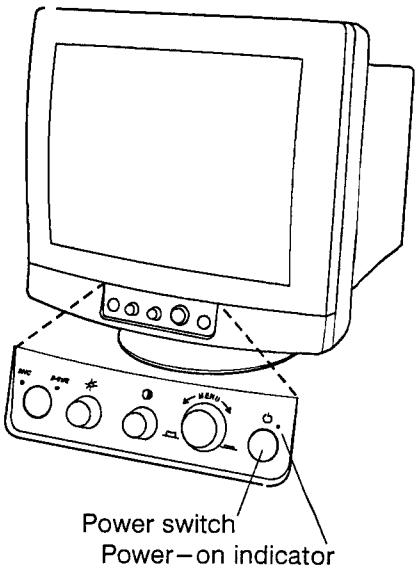
1.5.User Controls

1.5.1. Power Switch

Turning the Monitor ON and OFF

Push the **power switch** to turn the monitor on or off.

When the power is turned on, the **power–on indicator** will light.
The colour of the the power–on light indicates the operating state of the monitor.



Green ..... The monitor is in normal operation.

Red ..... The monitor is in automatic power off state.

Not illuminated .. The monitor is turned off with power switch or disconnected from mains outlet.

If the power management function working properly in your computer, you do not need to switch the monitor on or off. It happens automatically.

The power switch does not disconnect the monitor from mains. In oder to make the monitor completely powerless, unplug the power cord from power outlet.

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1.6.Menu

Basic Adjustments

The PICTURE SHAPE menu contains the most useful adjustments.

① The menu is called to the screen by pushing the Menu wheel.

② Select the property you want to adjust with the Menu wheel (e.g. WIDTH). The selected item in the menu is illuminated with white color.

③ Adjust the selected property (WIDTH) with the Menu wheel. The menu disappears and a scale shows the position of the adjustment. Turning the Menu wheel to the right increases the property and turning the Menu wheel to the left decreases the property.

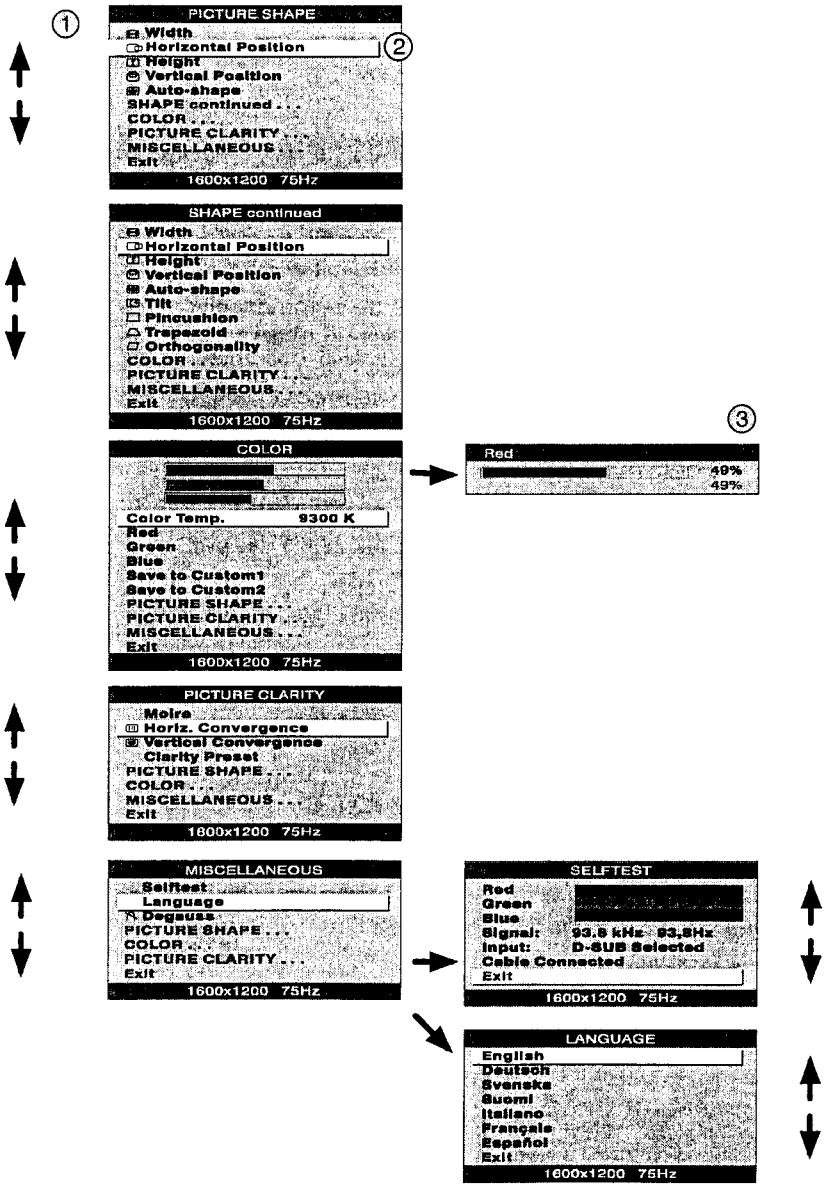
After adjusting, the new setting will be stored automatically.

All menu displays disappear automatically in a few seconds or at once by pushing exit.

The latest item can be called to the screen simply by pushing the Menu wheel.

If you want to adjust other properties select with the menu wheel the header which contains the adjustment you are looking for.

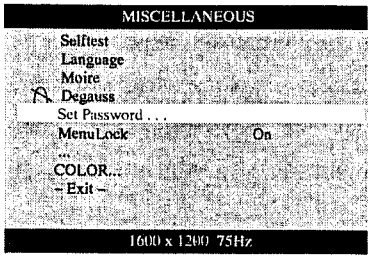
Open the selected submenu by pushing the menu wheel.



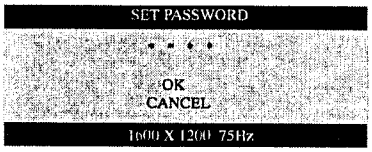
1.7. Password Functions

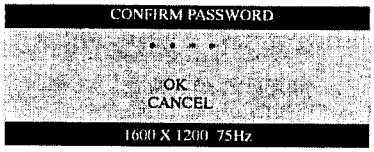
The Password functions will be inactive when shipped from the factory. The User will have to perform the following procedure to activate it:

- Move the cursor to the DEGAUSS adjustment press the Menu wheel and hold for 10 seconds. After that time the Set Password and Menu Lock shall be come visible.
- To deactivate (not visible) the function follow the same step has above (password will be delete also).



The user can set a password for OSM access control and can also specify whether the Password shall be active or not. Once password is activate (MENU LOCK ON) the user will be prompted to enter the password every time the OSM is called.



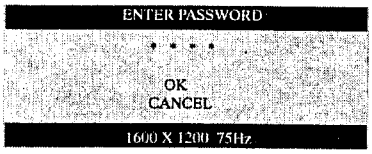


When the user enters the SET PASSWORD the cursor will be automatically placed on the place of the first number. The user can turn the Menu wheel to select numbers from 0...9 and selects the number by pressing the Menu wheel, which moves the cursor to the place of the next number. If user wants to delete the entered password, he must select CANCEL, which erase the complete password. Selecting OK will give another window to confirm the password. Selecting OK will store the set password and return to the MISCELLANEOUS menu.

Note ! If the user does not enter any number for a password, the MENU LOCK must be set to OFF.

In case the user has set a password and activated the MENU LOCK by setting ON, he will be prompted to enter the password every time the OSM starts up.

The procedure for entering the password is the same as in the SET PASSWORD window.



NOTE !

Besides the user defined password, there will be second password, allowing authorized personnel to enter the OSM in any case. This password shall be 3582.

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2. Site Preparation

2.1. Location

This Monitor is designed for normal office conditions. It is equipped with own power supply. It is not to be serviced or repaired on site

2.2. Troubleshooting

Local service facilities should perform simple maintenance such as trimming. More advanced maintenance and repair that requires replacement of components which in turn requires testing and re-trimming should be carried out in a central workshop.

Symptom		Measures
Picture screen is blank	The indicator on the front panel is not illuminated	Check that the power cord is correctly connected to the monitor and to the power outlet. If the monitor is powered through the computer, check that the computer is switched on with the mains switch. Use a desk light, for example, to verify that current is connected to a power outlet. If no electricity is connected to the outlet, call an electrician.
		Unplug the monitor from power outlet for about one minute.
	The indicator on the front panel is illuminated	Check that the signal cable connector is connected. If the connector is loose, tighten the connector's screws.
		The Monitor might be in stand-by position. Push one of the buttons or move the mouse.
		Unplug the monitor from outlet for about one minute.
		Switch off the monitor and the computer. Remove the signal cable from the computer. Switch on the monitor using the power switch. If the Selftest menu appears on the screen, it is evident that the monitor functions correctly and the problem is caused by an error in other parts of the system.
		Check the signal cable's connection pins. If the pins are slightly distorted, use nose pliers to straighten them.
		The Selftest menu appears. The computer may use a timing values which are out of the monitor's synchronization range.
Picture has colour defects		Demagnetize the monitor
		If colour defect is repeated without the monitor having been moved, it is possible that the monitor is influenced by a strong magnetic interference field (near to a high power cable, for example). Try to find a better location for the monitor or the interference source. Note that another monitor placed too near (less than 30 cm.) may also generate interference in the picture.
Picture has strong color defect,		Open the Miscellaneous/Selftest menu. Check the color of the Red, Green and Blue bars. If they have pure colors, the fault is not in the monitor. Check signal cable connectors and the computer. If the menu itself and the color bars are discolored, the monitor is obviously damaged.
Picture is stable but distorted		Your computer may use a timing for which the corresponding picture characteristic adjustments have not been set at the factory. Adjust the picture characteristics
Picture is unstable		Check the proximity of other electrical devices that generate magnetic fields, such as speakers, other monitors, electric fans and fluMake sure your compuer and video card are properly configured for your monitororescent light fixtures

The automatical appearance of the Selftest menu on the screen means that the signal is faulty or missing.

2.3. Checking the Operation of PowerSaver

The proper operation of the function requires a computer with VESA DPMS power management capabilities. Note that the power saving feature must be activated in the computer when checking the operation.

State	Colour of the power–on indicator	5V	7V	12V	Video
Normal Operation	Green	Yes	Yes	Yes	Yes
Stand–by	Green	Yes	Yes	Yes	No
Suspend	Green	Yes	Yes	No	No
Power Off	Red	Yes	No	No	No

DPMS (Display Power Management Signaling) is a trade mark of Video Electronics Standard Association (VESA)

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3. Controlling the Memory for Picture Adjustments

The picture adjustment values are stored in non-volatile memory. The memory has separated areas for User Adjustments and for Factory Adjustments.

3.1. Memory for User Adjustments

3.1.1. Adjustment

[1] If there are values available in the memory for user adjustments, corresponding to the present timing signals, they are always used.

[2] New user made adjustments are stored to the memory for user adjustments.

3.1.2. Resetting the User made settings for geometry or image

[3] User memory can be emptied from user made settings. **Resetting affects only the timing which is currently active**. The reset function is inhibited if no corresponding factory preset display mode exists.

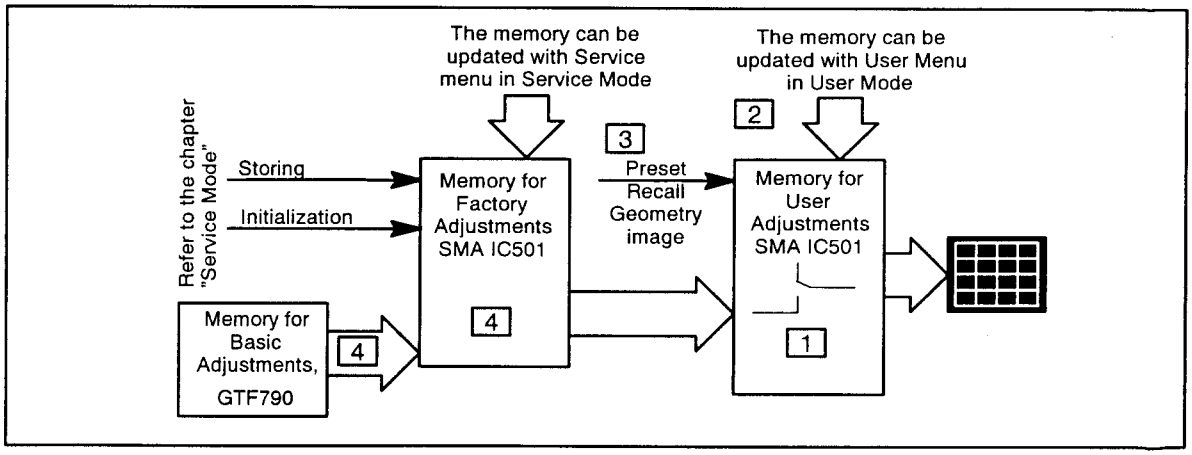
After resetting all picture properties are coming from memory for factory adjustments.

3.2. Memory for Factory Adjustments

3.2.1. Adjustment

[4] Factory adjustments can be updated with service menu in service mode. If there is no location in factory adjustment memory for timings currently in use, the adjustment affects the memory for user adjustments.

– If the memory location mentioned in case [1] is empty, the picture adjustment values are read from memory for factory adjustments. Factory adjustments, corresponding to the current timings, are transferred to user memory if any picture property is adjusted. After that the operation is as in case [1].



4. Service Mode

Service Mode is needed for updating of the factory adjustments for timings listed in the chapter Preset Display Modes. If there is no location in factory adjustment memory for display mode currently in use, the adjustment affects the memory for user adjustments.

4.1. Grouping of the Adjustments

There are three groups of software adjustments in service mode:
- Geometry Basic set
- Geometry Advanced set
- Grey Scale adjustment set

The following table shows how the adjustments act in relation to the display modes.

Adjustment	Common for all Display modes	Separate for each Display mode	Available in User Mode	Available in Service Mode
Brightness	X			X
Horizontal centring		X	X	X
Vertical centring		X	X	X
Height		X	X	X
Width		X	X	X
Pincushion		X	X	X
Trapezium		X	X	X
Orthogonality		X	X	X
Horizontal convergence	X		X	X
Vertical convergence	X		X	X
Moire		X	X	
Pincushion balance		X		X
Horizontal raster centring	X			X
Tilt	X		X	X
G2	X			X
Max contrast	X			X
R Blacklevel	X			X
G Blacklevel	X			X
B Blacklevel	X			X
R Amp	X			X
G Amp	X			X
B Amp	X			X
Raster	X			X

Common adjustments need to be adjusted only once. Separate adjustment must be performed for every display mode to be stored.

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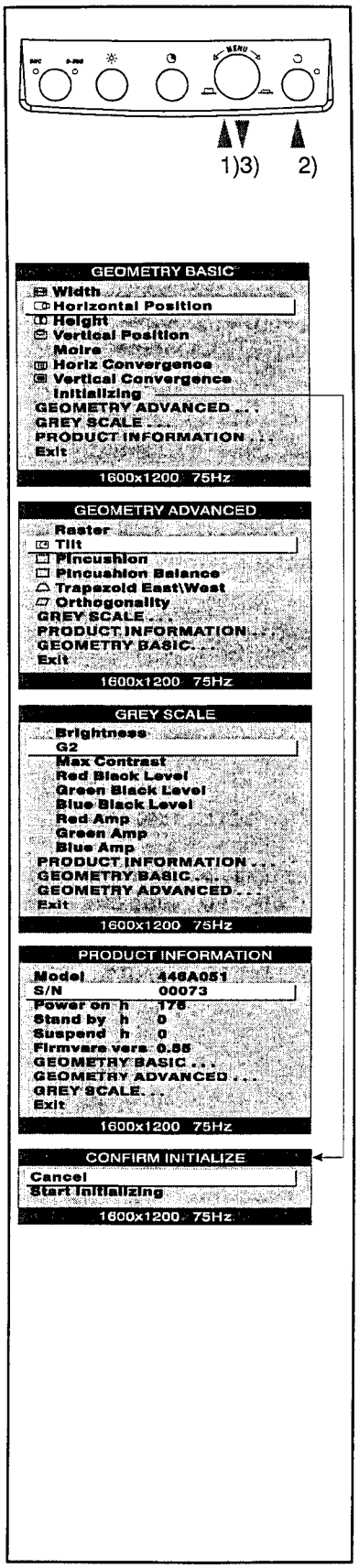


4.2. Service Menu

4.2.1. Access to Service Mode

Active the service mode always in 107.1 kHz/85 Hz (GTF790).

First switch OFF the monitor with power switch.

1) Push the Menu wheel down.
2) While keeping the Menu wheel down, switch ON the monitor.
3) Release the Menu wheel **when the picture has appeared.**
4) Press the Menu wheel.
5) Insert the password 7711 and select OK with the Menu wheel.

Select the items in the Menu with by turning the Menu wheel. Push the Menu wheel to open Geometry Advanced , Grey Scale or Product Information Submenu or to Initialize the memory IC. Adjust each property with the Menu wheel.

4.2.2. Geometry Basic and Advanced

Geometry submenus contain placement, size and shape adjustments.

4.2.3. Grey Scale

This monitor has six preset tints. With tint numbers smaller than 4 the picture becomes reddish and with tint numbers greater than 4 the picture turns blue.

Tint no	1	2	3	4	5	6	7
Colour Temperature	5000K	6000K	6500K	7000K	8000K	9300K	10000K

The grey scale adjustment affects directly tint number 6 (9300K) only. Other tints are derived automatically from 9300K colour temperature.

4.2.4. Initializing the Replacement IC501 on SMA board

If the memory for factory adjustments is replaced, it must be initialized. During initializing all memory locations are written with approximate values. They must be updated in service mode as explained in the chapter 'Adjustment Procedure'.

- Activate service mode as explained before.
- Select INITIALIZING in the Geometry Basic menu.
- Confirm Initialization by selecting Start Initializing and pushing the Menu wheel.
- Switch OFF the monitor.

Caution
Initializing of a programmed memory IC deletes all user and factory made adjustments.

4.2.5. Storing the adjustments

When the adjustment is ready, return to the menu by pushing The Menu wheel. The new setting is stored automatically.

4.2.6. Exit from service mode

1. Select exit from the Geometry Basic / Geometry Advanced or Grey Scale menu
2. Switch off the monitor.

5. Workshop Maintenance

5.1. Important Safety Notice

The components, which are important for safety, are marked with special mark ⚠ on the circuit diagram. It is essential that these critical parts should be replaced with manufacture's specified parts to prevent X–radiation, shock, fire or other hazards.

For your own safety, use always safety isolating transformer when repairing the monitor.

5.1.1. Discharging the CRT

High voltage circuitry includes bleeder resistor which normally discharges the tube in about 5 seconds after the power is switched off. If you – for safety reasons – want to be sure about the discharging, do as follows:

Wear safety goggles. A cracked CRT may implode when discharged.
The signal cable must be disconnected from the computer.

To discharge the CRT, a flat–head screwdriver with grounding cable is required.

- Disconnect the power cable.
- Connect the metal chassis of the monitor to reliable earth.
- Connect the grounding wire to the screwdriver.
- Connect the other end of the grounding wire to the chassis (earth).
- Insert the screwdriver under the rubber cap of the EHT connector to discharge the tube.
- Disconnect the power cable.

5.2. ESD–Sensitive Parts

To prevent damage, when working with electrostatic discharge (ESD) sensitive parts, observe the following instructions:

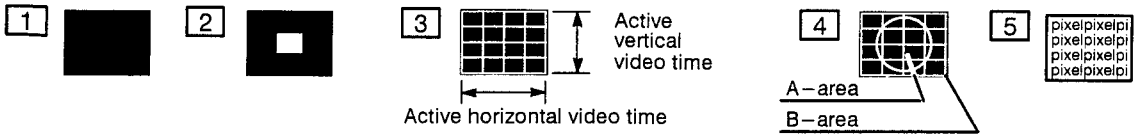
- Keep the ESD–sensitive part in its original shipping container until you are ready to install the part into the component card.
- Just before touching the ESD–sensitive part, discharge to the monitor any static electricity in your body; do this by touching the metal frame or cover of the machine. If possible, keep one hand on the frame when inserting or removing a logic card, for example.
- Hold the ESD–sensitive part by its edge; do not touch its pins.

5.3. Test Equipment

The following test equipment are required to adjustment procedure.

- Safety isolating transformer
- Digital multimeter: Fluke 87 or equivalent true RMS multimeter
- High voltage probe: e.g. Fluke 80–40k
- Signal generator: VTG220 + PC or programmable video generator
- Color analyzer: e.g. Minolta TV Color Analyzer CA100
- Convergence Gauge (CM7AR or equivalent)
- Oscilloscope 40–100 MHz band width
- Hi–Pot tester (Flash tester with insulation measurement / Leakage current / Break down voltage)
- ESD protection necessary

5.4. Test Patterns



1 Black Picture
- Signal level = 0 V at each RGB input

2 Highlight grey scale tracking
- Signal level = 700 mV in the window at each RGB input

3 Crosshatch Picture
- Squares e.g. 20 mm x 20 mm
- Outmost lines correspond the active vertical/horizontal video time

4 Convergence test pattern

5 Focus test pattern

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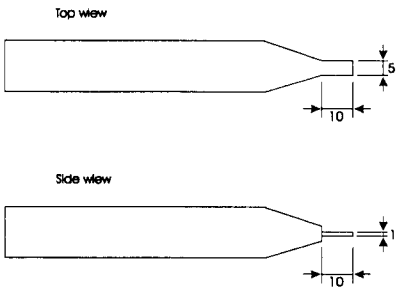
5.5. Disassembly

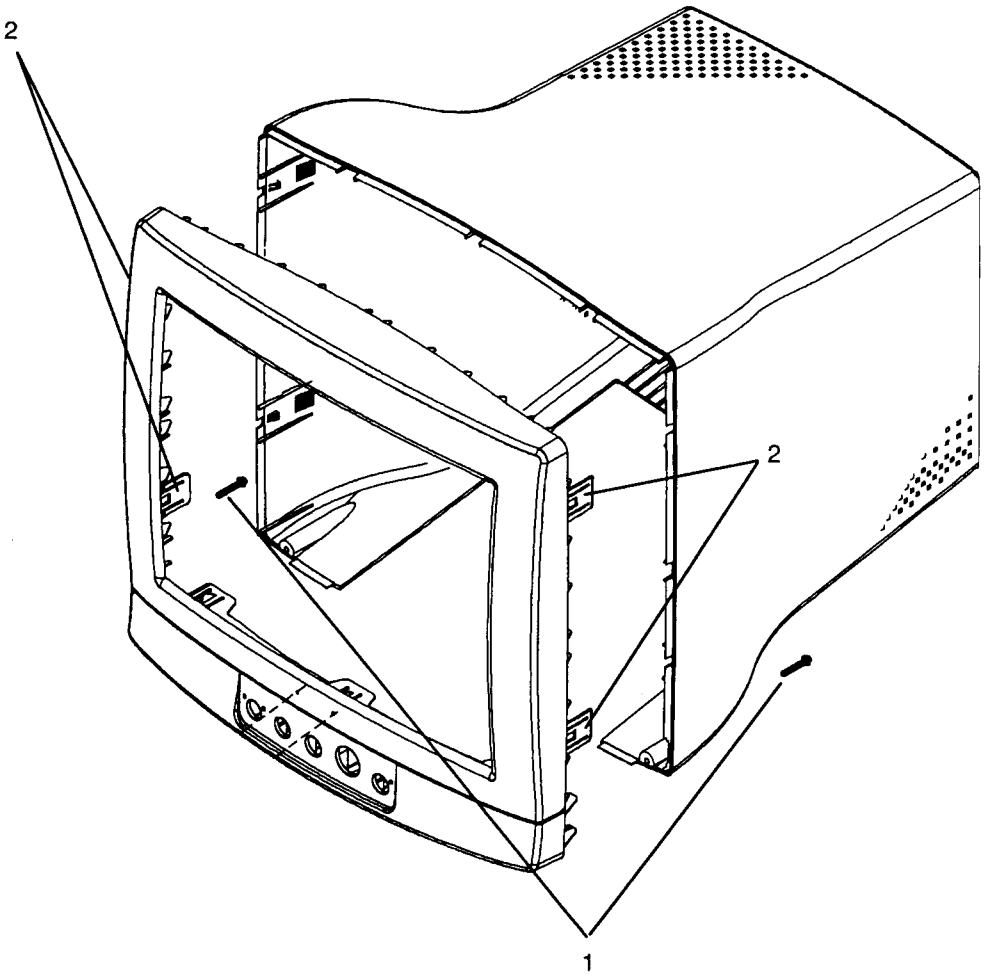
5.5.1. Cabinet

Set the monitor on cushion picture tube facing down

1. Loosen and remove two screws.
2. Open the plastic pawl with a screwdriver or the special tool (for instance 860006)

860006



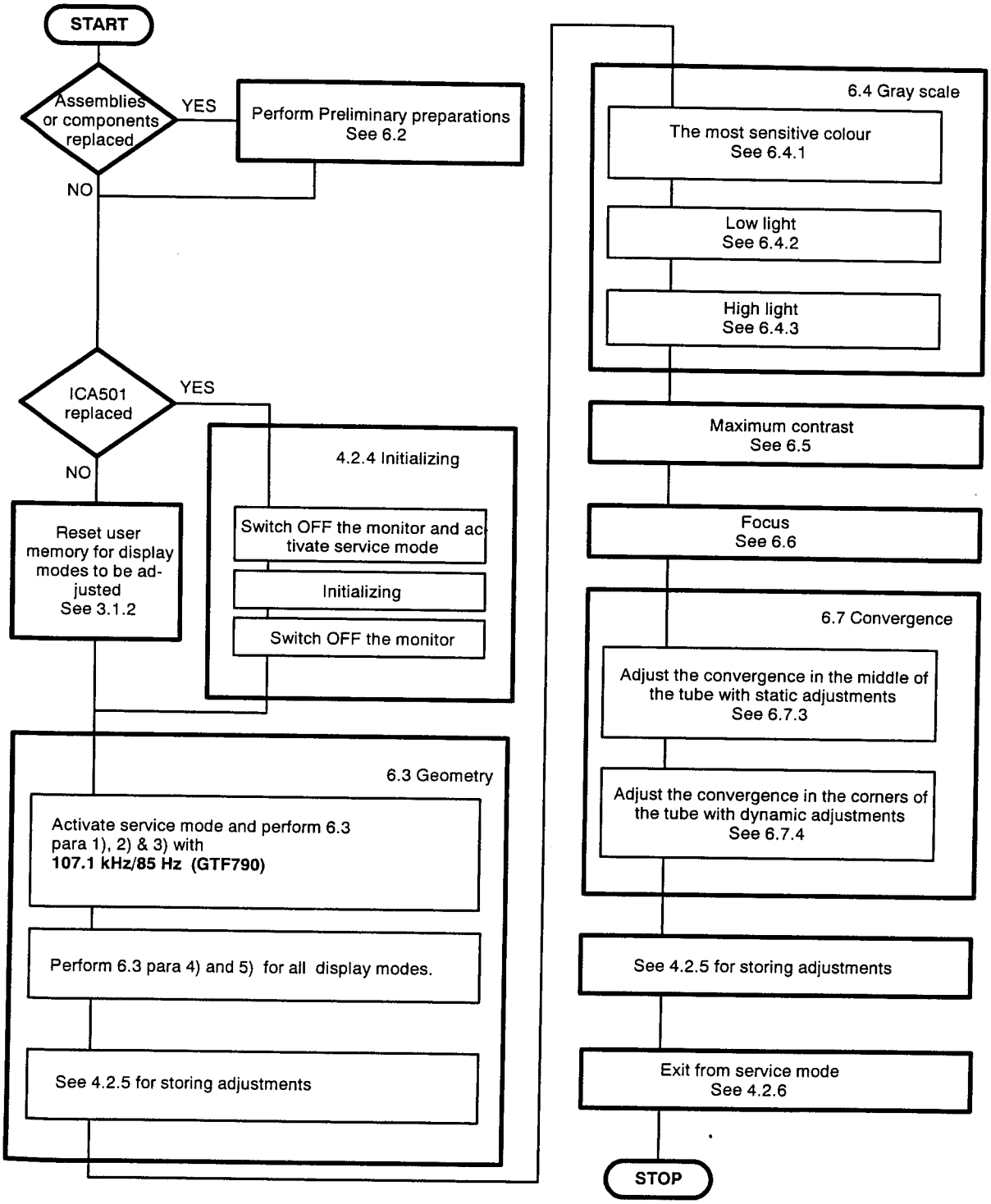


6. Adjustment Procedure

The following procedure must be carried out in case of large service operations e.g. when a circuit board or nonvolatile memory ICA501 has been replaced by a new one.

The order of adjustments explained here has been found to produce the desired result with the minimum of effort. Adjustments can also be made in another order or completely separately.

6.1. Adjustment Flow Diagram


START
Assemblies or components replaced
YES
Perform Preliminary preparations See 6.2
NO
ICA501 replaced
YES
NO
Reset user memory for display modes to be adjusted See 3.1.2
4.2.4 Initializing
Switch OFF the monitor and activate service mode
Initializing
Switch OFF the monitor
6.3 Geometry
Activate service mode and perform 6.3 para 1), 2) & 3) with 107.1 kHz/85 Hz (GTF790)
Perform 6.3 para 4) and 5) for all display modes.
See 4.2.5 for storing adjustments
6.4 Gray scale
The most sensitive colour See 6.4.1
Low light See 6.4.2
High light See 6.4.3
Maximum contrast See 6.5
Focus See 6.6
6.7 Convergence
Adjust the convergence in the middle of the tube with static adjustments See 6.7.3
Adjust the convergence in the corners of the tube with dynamic adjustments See 6.7.4
See 4.2.5 for storing adjustments
Exit from service mode See 4.2.6
STOP

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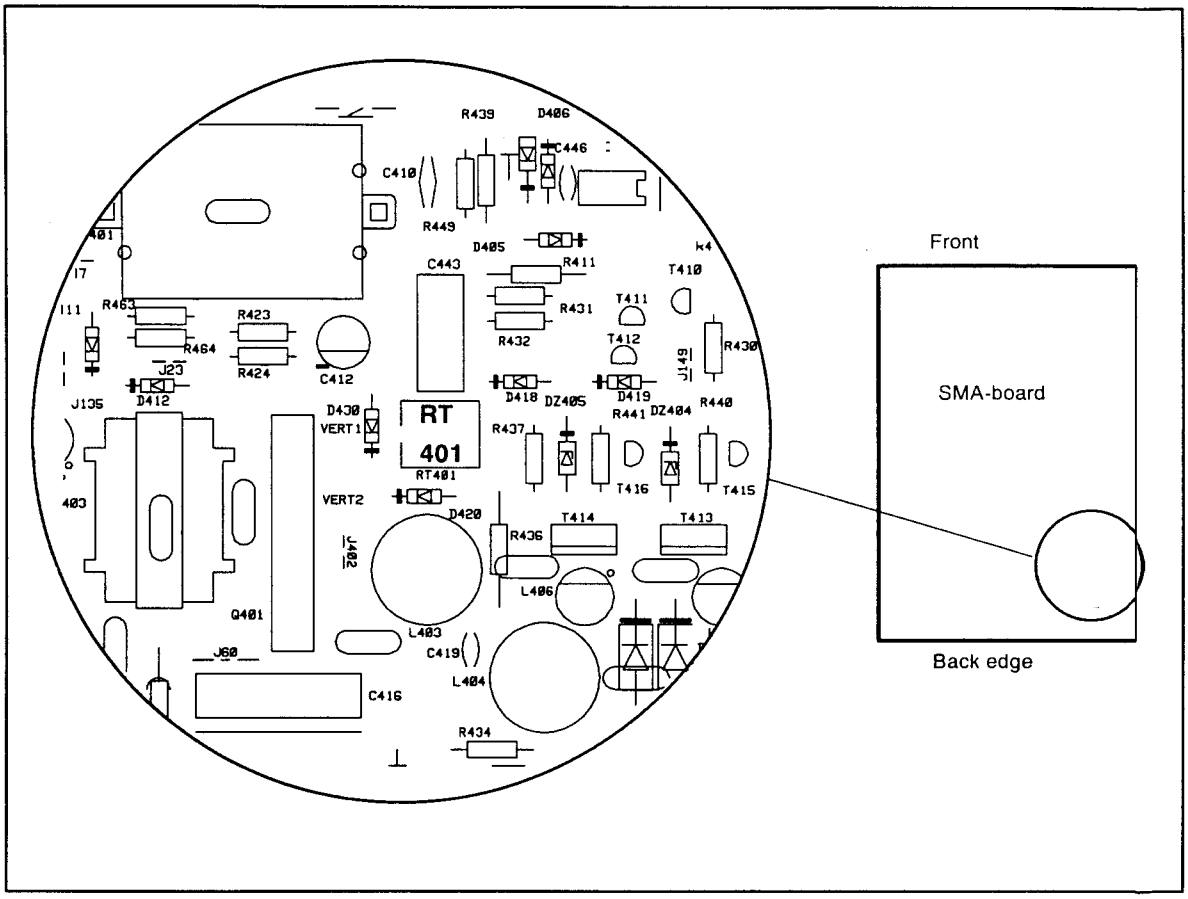
6.2. Preliminary Preparations

Connect the signal cable to the PC. Switch on the monitor and the PC. Let the monitor warm up for 20 minutes before starting the adjustments.

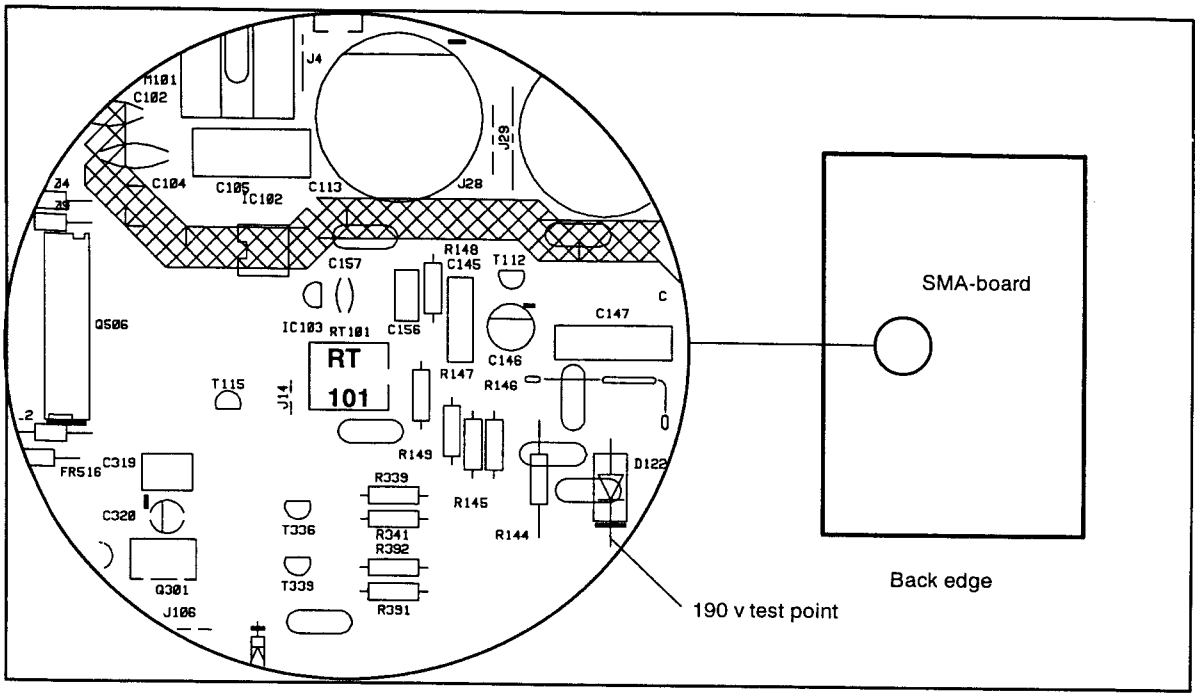
6.2.1. Coarse width

- Select 107.1 kHz/85 Hz (GTF790) crosshatch test pattern
- Set width to the 65% of the maximum with menu adjustment
- Set width equal to the mask aperture (400 mm) with coarse adjustment **RT401**



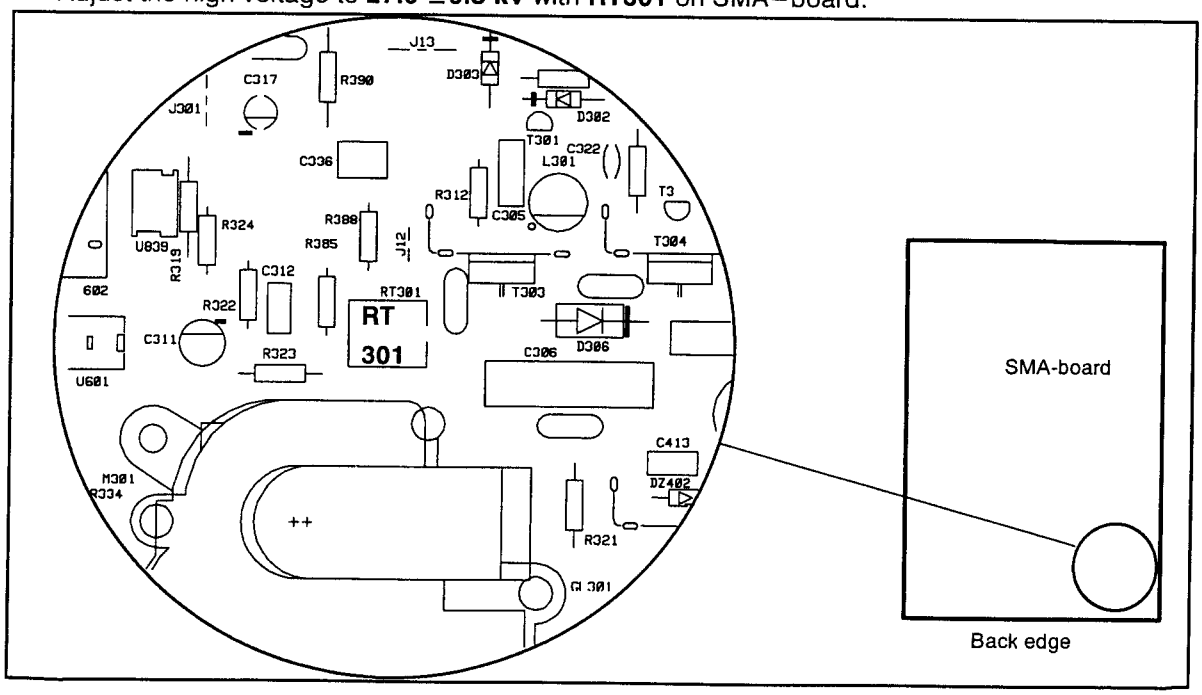
6.2.2. Operating voltage

Connect the DVM to 190 v test point. Adjust trimmer **RT101** on SMA –board for a voltage of **190 ± 0.5 V.**



6.2.3. High Voltage

- Select 31.47kHz/60Hz (NCE300) crosshatch test pattern.
- Connect the high voltage meter to the anode of the picture tube.
- Adjust the high voltage to **27.0 ±0.3 kV** with **RT301** on SMA–board.



6.2.4. Preliminary Picture Adjustments

1) Select 107.1 kHz/85 Hz (GTF790) crosshatch test pattern.
2) Set ◑ to maximum and adjust ☼ until the background is faintly visible.
3) Adjust focus if poor.

Remember

- Do not adjust **G2**–voltage with potentiometer or keypanel if you have reason to belive that there is no need to adjust gray scale.

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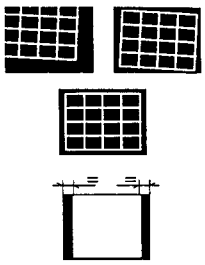
6.3. Geometry

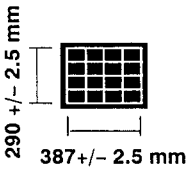
Activate Service Mode in 107.101kHz/85Hz (GTF790).

Degaussing must be carried out before the picture adjustments. Degaussing shall be repeated if the monitor is moved.

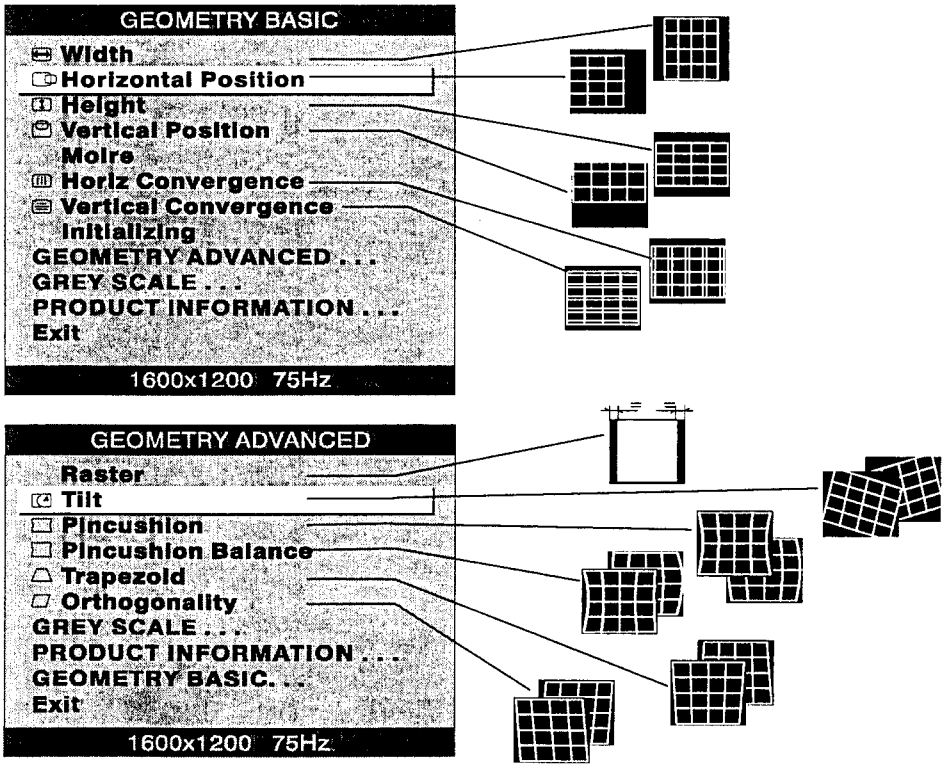
1) Select **107.1 kHz/85 Hz** (GTF790) crosshatch test pattern.
   Set ◑ to maximum and adjust ☼ until the background is faintly visible.
   Reduce width until both vertical edges of the **background** are visible.
2) Straighten the picture if tilted.
   This adjustment is common for all display modes.
3) Centre the background.
   This adjustment is common for all display modes.



4) Adjust size, position and shape of the picture equal to the mask aperture. Adjust first the properties with largest deviation from the correct value.
5) Adjust final width and height.



6) Repeat steps 4) and 5) for every display mode to be stored. Note that the display mode can be changed without leaving the service mode.



6.4. Grey Scale

The grey scale is adjusted for 9300K colour temperature.

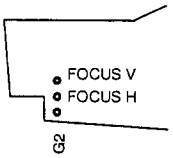
6.4.1. The Most Sensitive Colour

The most sensitive colour has been marked in a label on the deflection yoke. It may not be correct if tube or SMH card has been changed. In that case judge the most sensitive colour from the tone of the picture after you have made the following adjustments.

1) Select **107.1 kHz/85 Hz** (GTF790) black test pattern.
2) Set ☼ to maximum and ◑ to minimum.
3) Set Blacklevel adjustment **RED/GREEN/BLUE Black Level** to 12% of the maximum.
4) Set **RED/GREEN/BLUE Amp** menu adjustments to center (50%).
5) Set **G2 menu** adjustment to center (50%).
6) Place the probe of the colour analyzer in the middle of the screen and adjust with **G2 trimmer** until the picture brightness is 3±0.5 nit.

6.4.2. Low Light

1) Select **107.1 kHz/85 Hz** (GTF790) black test pattern.
2) Adjust picture brightness to 1.0 nits with ☼ potentiometer.
3) Adjust the ◑ with potentiometer to the minimum.
4) Adjust the colour coordinates to (9300K)
   x = 0.283±0.020
   y = 0.298±0.020
   with **RED/GREEN/BLUE Black Level** adjustments.
   Do not adjust the most sensitive colour.
5) Set ☼ to the maximum and check that the brightness is still 3±0.5 nits. If not, repeat 6.4.1. steps 5) and 6).
6) Adjust picture brightness to 1.0 nits with ☼ potentiometer and check the colour coordinates.



Left side view of the chassis

6.4.3. High Light

1) Select **107.1 kHz/85 Hz** (GTF790) black test pattern.
2) Adjust with ☼ the picture brightness to 1±0.5 nits.
3) Select 107.1 kHz/85 Hz window test pattern.
4) Adjust with ◑ the picture brightness in the window to 70±5 nits.
5) Adjust with **RED/BLUE Amp** the colour coordinates in the window to
   x = 0.283±0.020
   y = 0.298±0.020
   Check after adjustment that the brightness reading is in limits.

6.5. Maximum/Minimum Contrast

1) Set ◑ to the maximum.
2) Adjust with ☼ potentiometer the picture brightness outside window to 0.5 nits or its maximum position.
3) Adjust brightness in the window to 145±5 nits with **MAX CONTRAST**.
4) Set ◑ to the minimum.
5) Check that the minimum brightness is between 10 and 25 nits.
6) Exit from service mode.

6.6. Focus

1) Select **107.1 kHz/85 Hz** (GTF790) crosshatch test pattern
2) Set ◑ to the maximum and adjust ☼ until the background is faintly visible
3) Adjust the sharpness with **FOCUS H** and **FOCUS V** to optimum
4) Adjust ☼ until the background is invisible
5) Select focus test pattern. Check that all letters are clearly visible

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6.7. Convergence

Reduce first the convergence error in the middle of the screen to minimum using static adjustments. After the convergence is faultless in the middle of the tube, use dynamic adjustments to eliminate the error in the edges of the tube.

Static adjustments affects the whole picture area:

- Service mode Convergence menu adjustments (horizontal + vertical).
- Magnet ring set on the tube neck (horizontal + vertical)

6.7.1. Measuring Conditions

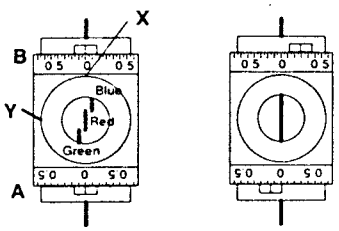
- Adjust convergence with 107.1 kHz (GTF790) line frequency
- Make sure that focus is correctly set at the mid-point between the screen center and the edge of the picture.
- Use white crosshatch test pattern with circle.
- Adjust ◑ to near the maximum and reduce ☼ until the background disappears.

6.7.2. Convergence Measuring Gauge CM7AR

The use of the Klein CM7AR Convergence Gauge has been explained here but other types of gauges can be used as well.

Check that the adjusting knobs (A & B) are set to zero.

- Place the gauge on the line with marking **Y up** upwards when measuring horizontal line.
- Place the gauge on the line with marking **X up** upwards when measuring vertical line.
- If the line has convergence error, the line in the window seems to be broken.
- Use knobs A and B to adjust the line continuous.
- If the readings are on the opposite side of zero, the convergence error is A+B (e.g. 0.2 + 0.1 = 0.3).
- If the readings are on the same side of zero, the convergence error is equal to A if A > B or B if B > A

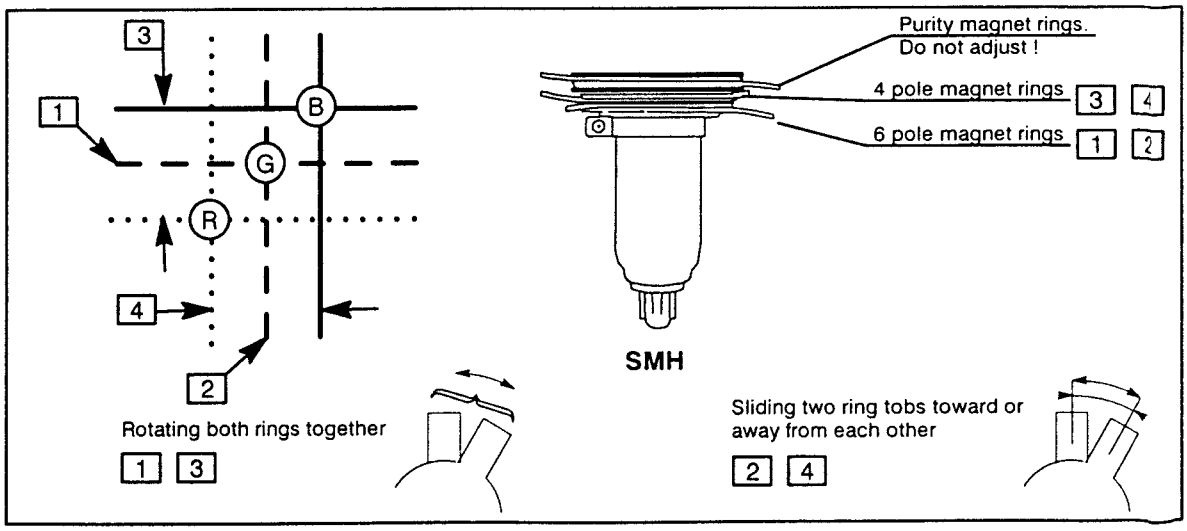


6.7.3. Static Convergence

The magnet rings has been set to the optimum in the factory. Readjustment is necessary only in case the adjusting magnets have been accidentally moved.

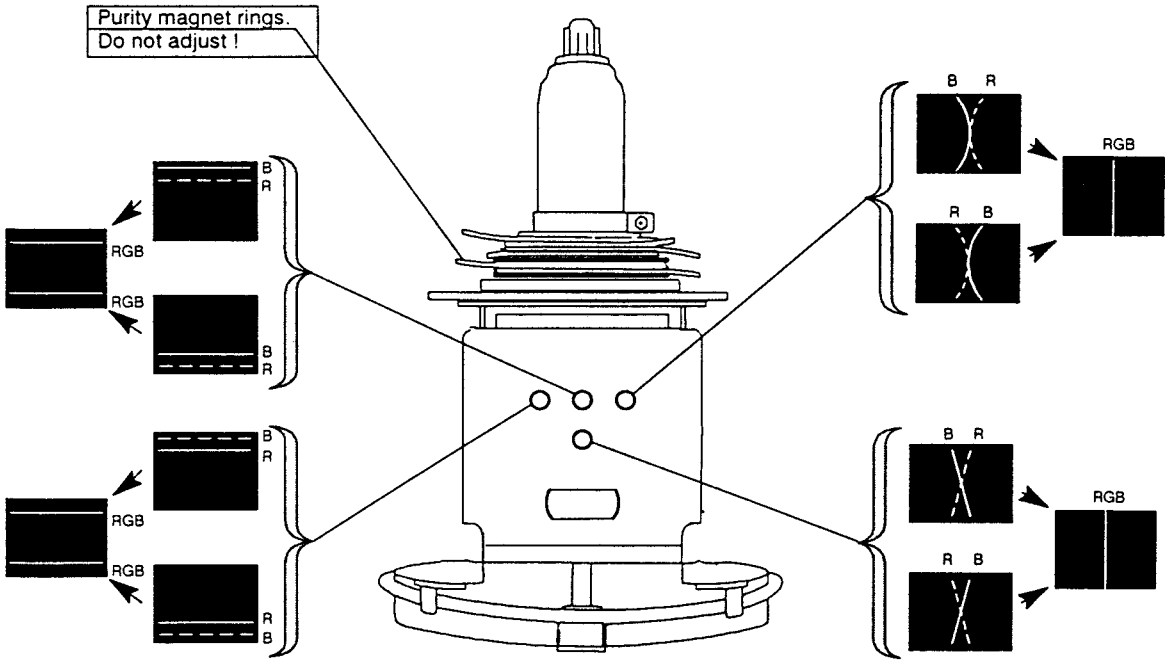
[1] Adjust G vertically in the middle between R and B with 6 pole magnet rings.
[2] Adjust G horizontally in the middle between R and B with 6 pole magnet rings.
[3] Adjust R and B vertically to the same position with G line with 4 pole magnet rings
[4] Adjust R and B horizontally to the same position with G line with 4 pole magnet rings

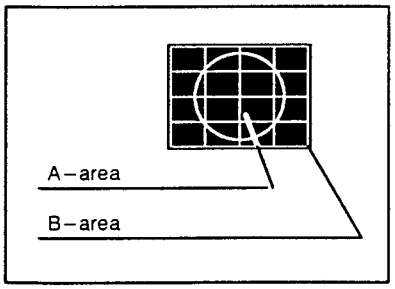
Lock the rings with paint



6.7.4 Dynamic Convergence

Deflection yoke trimmers





6.7.5 Allowed Error Levels for Convergence

Area A: ≤ 0.2 mm
Area B: ≤ 0.3 mm

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6.8. Colour Purity

Do not move purity magnet rings. If the purity magnet rings are found to have moved during transportation or handling, set them just in the original position by tracing the locking paint put on purity magnet rings and holder of beam bender and then readjust the static convergence.

6.9. Screen and faceplate Blemishes

6.9.1. Test Procedure

Set up the tube and adjust the light output on a blanked raster at the centeer of the screen for approximately 17 cd/m2 (5 footlamberts) and C.I.E x= 0.281, y= 0.311 (or C.I.E x=0.313, y=0.329) color temperature. The screen should be viewed at a minimum distance of 60 cm. Ambient light level at the tube face should be approximately 1.0 lux.

6.9.2. Classification of Screen and Faceplate Blemishes

Blesmishes are divided into phosphor screen blemishes and glass bulb blemishes.

Phosphor Screen Blesmishes

Blemishes are classified depending upon the next table and judged with the standard specified in Clause 6.9.4.

Category	Contents of Blemish
Entire defects	Black spot 50% or more of complete dot is missing
Partial defects	25 – 49 % of complete dot is missing
Other defects	Non–uniformity lighted part. Sumdge and so on.

Faceplate Blemishes

Blemishes are classified as scratches and bulb defects and judged with the standard specified in Clause 6.9.5.

6.9.3. The Quality Areas

Zone A: rectangular area (sides X and Y) of which the point of intersectionof the diagonals coincides with the mechanical center of the screen.

	Screen size	
	X	Y
Zone A	360 mm	270mm

Zone B: The remaining screen area except Zone A.

6.9.4. Limits of Phosphor Screen Blemishes

Entire defects and partial defects

Category		Allowable maximum number		Allowable minimum separation
	1 trio	A	B	20
		3	–	
Entire defects	3 adjacent same color	0	–	
= / > 50% Black spot	2 adjacent same color-dots	1	–	
	2 adjacent different color dots	2	–	
	1 dot	6	–	
Partial defects 25 – 49 % of complete dots is missing		–	–	
Total piece of defects excluding partial defects		7	–	

Other defects

Equivalent diameter of the total area should be less than 13 mm

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6.9.5. Limits of Faceplate Blemishes

Scatches

The following criteria is applied to scratches on the faceplate of color display tubes. Maximum size of scarches allowable:

Width (mm)	Lenght of single scratch	Allowable number
0.05 or less	Ignore	–
0.06–0.12	50 or less	1
0.13–0.20	30 or less	1
over 0.21	rejected	0

Limits of Faceplate Defects

The following criteria is applied to defects of useful screen on panel face.

Zone			Zone A	Zone B
Permissible major defects	Blister (mm)		0.51–0.70 mm	0.51–0.70 mm
	Opague Spot and Open Blister (mm)		0.41–0.60 mm	0.41–0.60 mm
	Allowable Number of Defects	Single zone	2	3
		Total	4	
	Allowable Minimum Separation (mm)		57 mm	
Gathering Defect within Ø50mm	Blister (mm)		0.26–0.70 mm	
	Opaque spot and open blister (mm)		0.20–0.60 mm	
	Allowable number of defects		6	
	Allowable minimum separation (mm)		12.7 mm	
Elongated		Width (mm)	0.10–0.20 mm	0.10–0.30 mm
		Length (mm)	4.0 mm	4.0 mm
		Allowable number of defects Total	4	

Limits of Coating Defects

Coating defetcts are classified depending upon the next table and judged with the standard specified in clause 2

Limits of Coating Defects

Coating defetcts are classified depending upon the next table and judged with the standard specified in clause 2

Rings of defect	Content of defects	Valuation of defect
Hight–contrast	Reflective spots and coating voids	The number of defects and quality area
Low–contrast	Cloudy visible by reflection	Ditto
Elongated	Same reflectance as low contrast Not include high contrast reflectance	Ditto

Kinds of defect / Zone		Zone A				Zone B			
High–contrast	Size of defects	less than 0,5	0,5 – 1,0	1,1 – 1,5	over 1,6	less than 0,5	0,5 – 1,0	1,1 – 1,5	over 1,6
	Allowable number of defects	ignore	5	3	0	ignore	5	3	0
	Allowable minm-mum separa-tion	–	30			–	30		
Low–contrast	Size of defect	less than 1,5	1,5 – 3,0		over 3,1	less than 1,5	1,5 – 3,0		over 3,1
	Allowable number of defects	ignore	3		0	ignore	3		0
	Allowable minimum separa-tion	–	20			–	20		
Elongated	Width	3,0 or less				ignore			
	Maximum lenght	less than 10			10 or over				
	Allowable number of defect	3			0				

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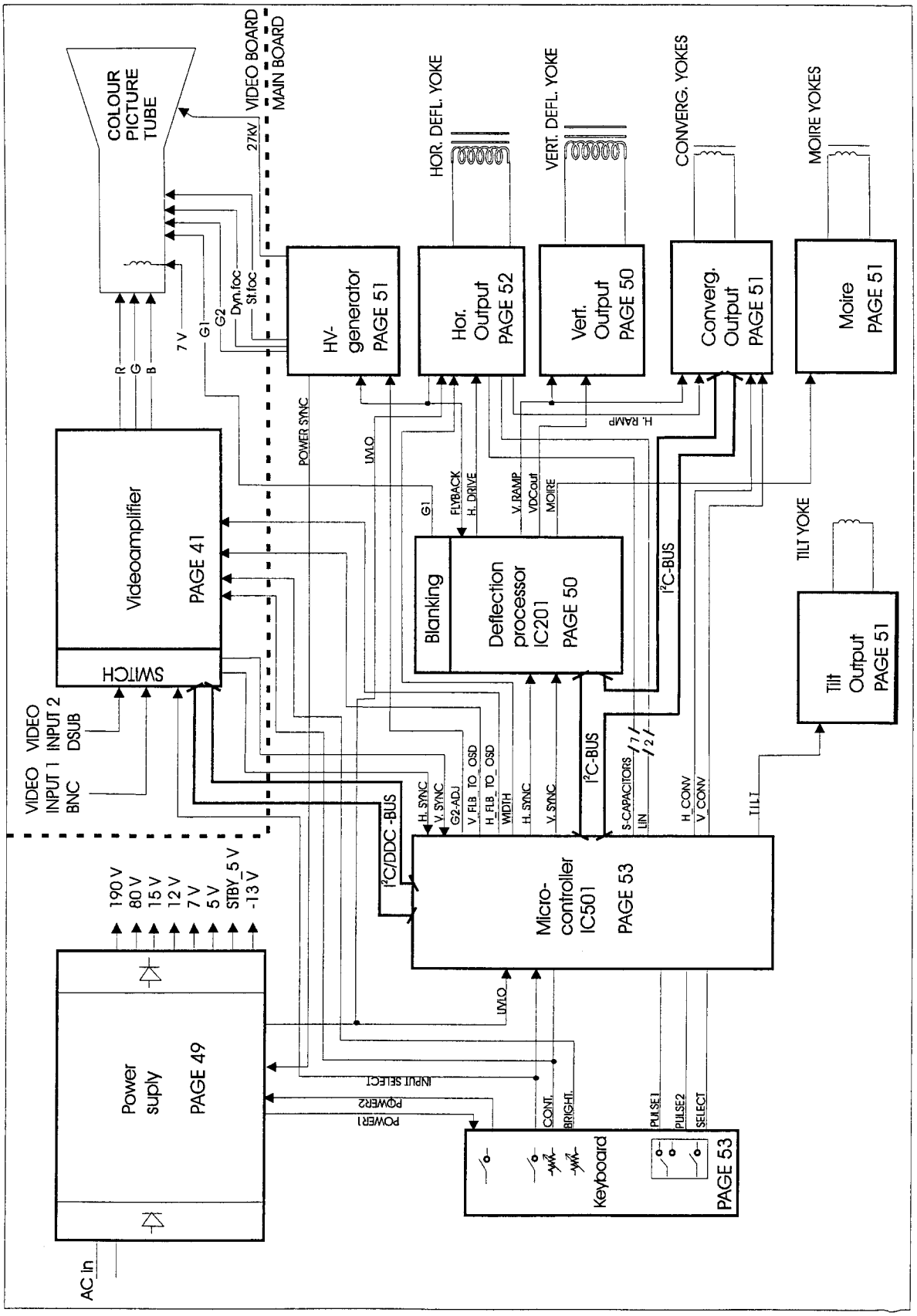
BLOCK DIAGRAM



Page numbers references the page numbers of the schematic diagrams.

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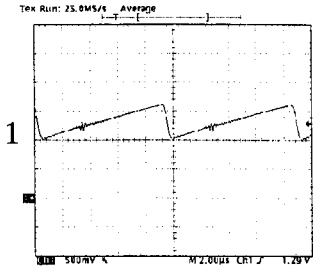

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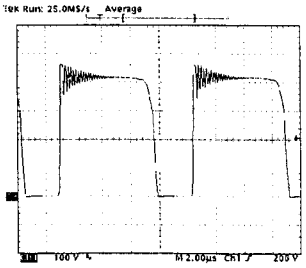

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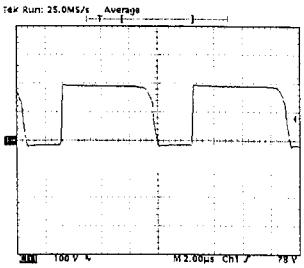

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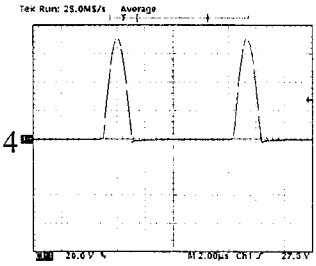

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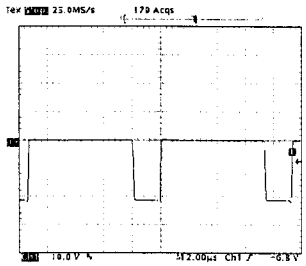

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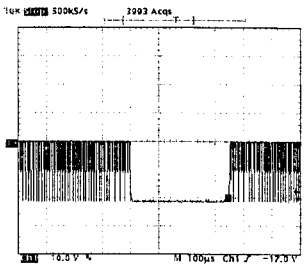

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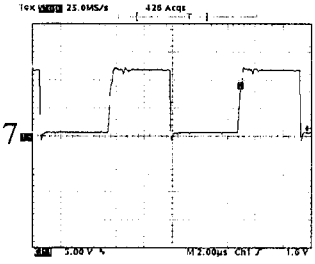

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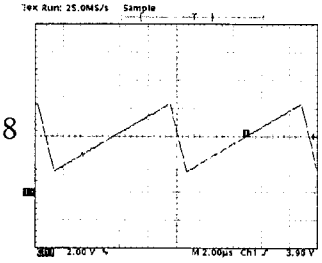

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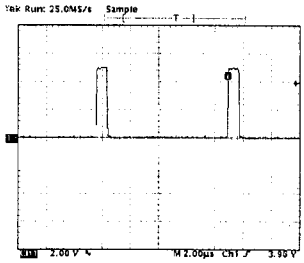

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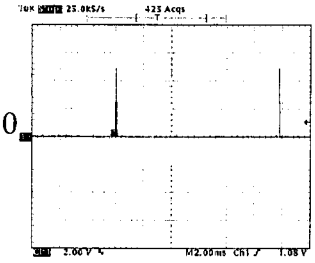

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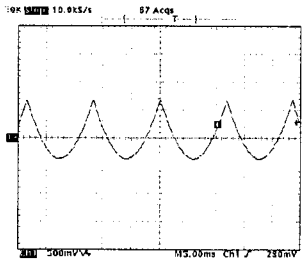

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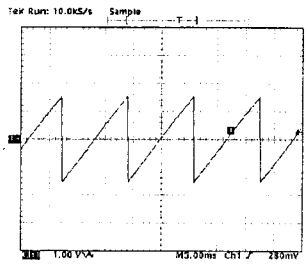

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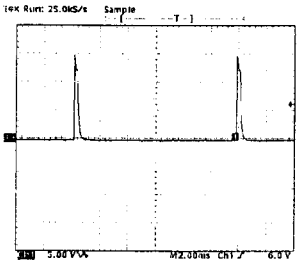

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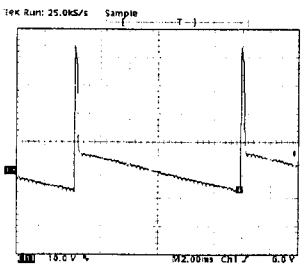

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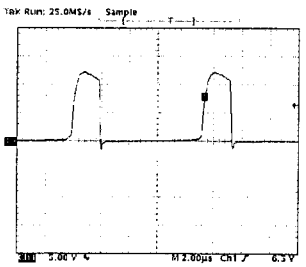

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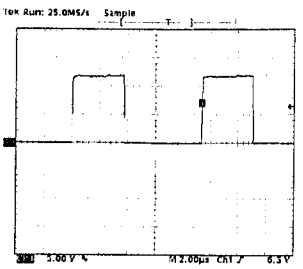

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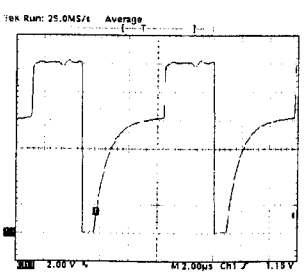

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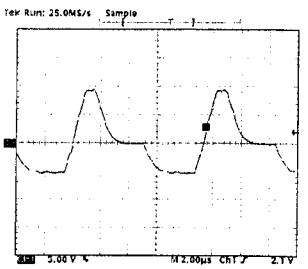

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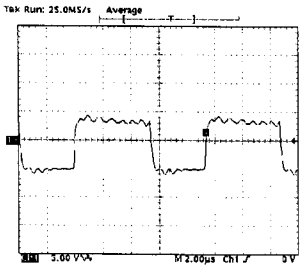

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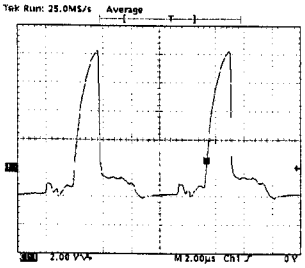

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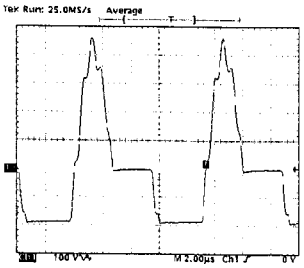

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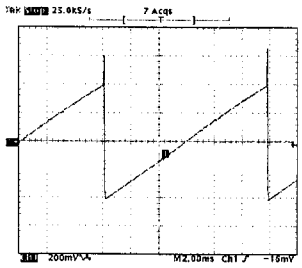

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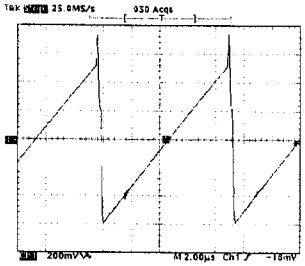

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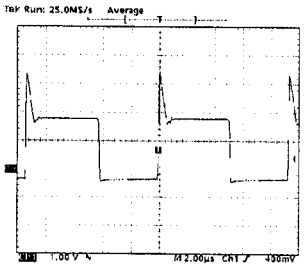

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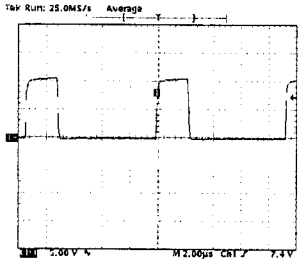

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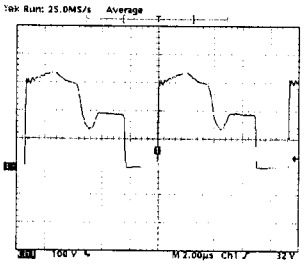

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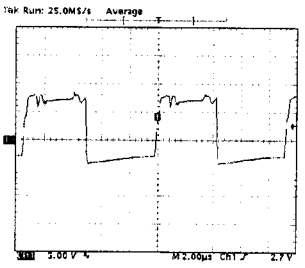

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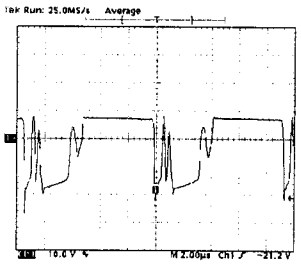

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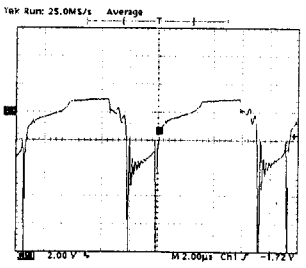

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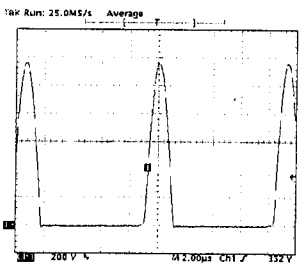

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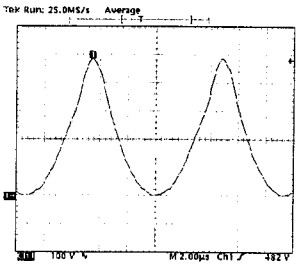

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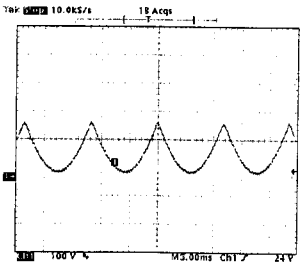

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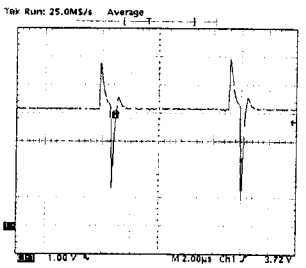

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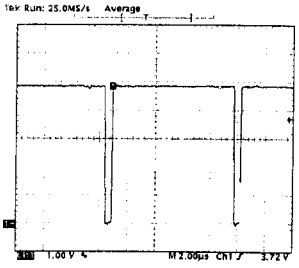

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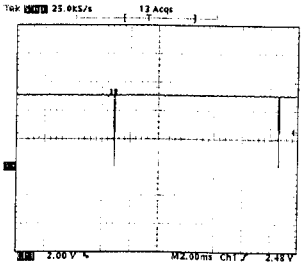

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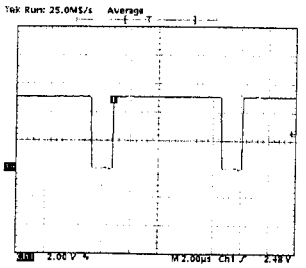

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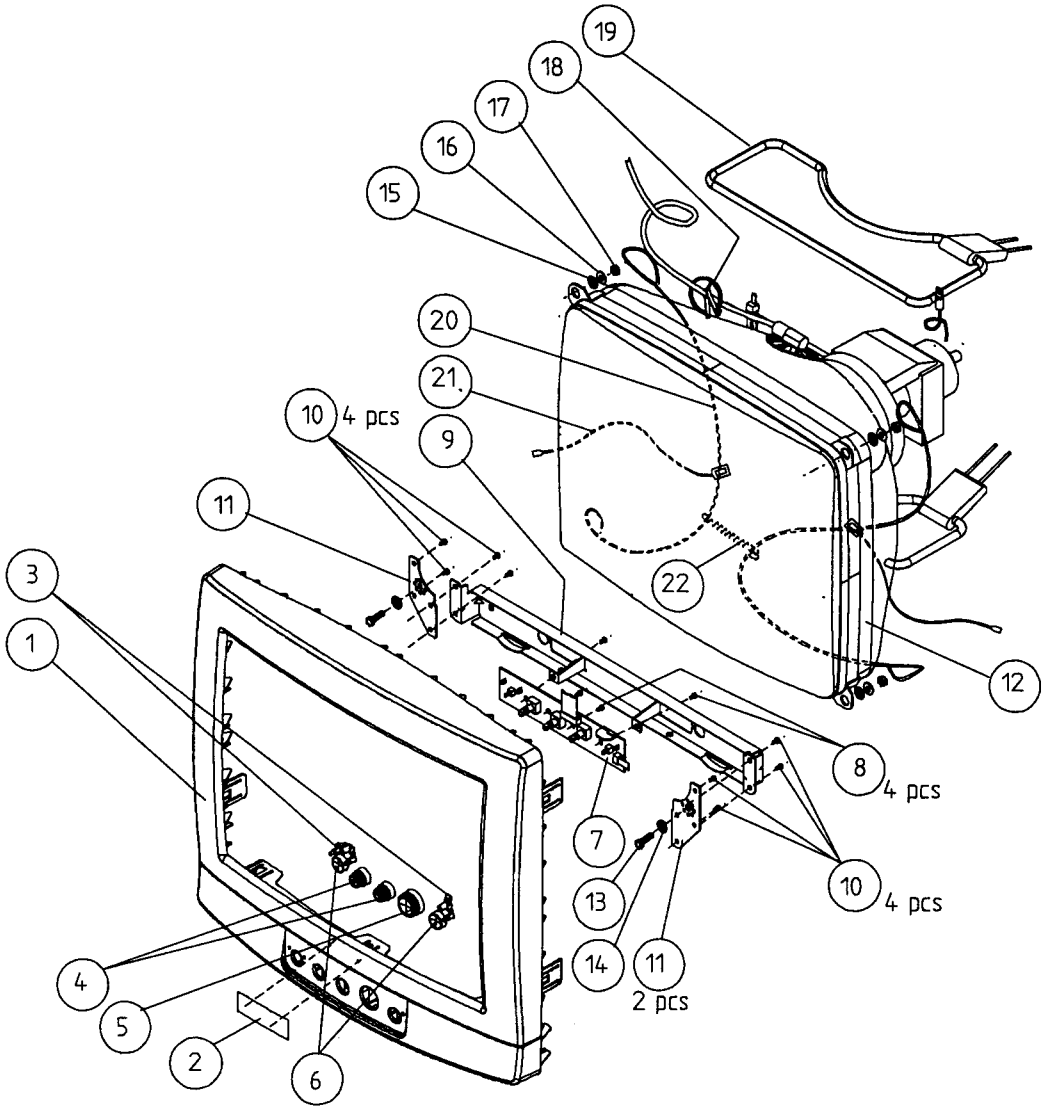
Spare Parts

P/N	Description	Emission	Prod P/N
446Xpro	19" Nokia Basic EU Model	TCO	446A051
446Xpro	19" Nokia Basic US Model	TCO	446A059



Part Number	Description	PG	Item Number	Model
UM7701A	Bezel 19" TCO-Wire Assembly DN30256	27	1	
UA1243	Badge NOKIA	08	2	
UA7108	Light pipe	03	3	
UT1831	Knob,small	07	4	
UT1830	Knob,big	08	5	
UT1832	Button	03	6	
SMZ053	Control Module (included in SMA)	*	7	
WC0371	Pt-screw KB30x8 WN1442 Black	01	8	
UC6909	Support shield	05	9	
WC0353	Screw KB 40x10 WN1447	01	10	
UC6908	Clamp	03	11	
NM1037	Picture tube 19""/90 M46LLQ683x02(U) U-Coat Hit	69	12	
UC6916	Hexagon screw DIN933 M6x20SFS2064	08	13	
UL0131	Friction plate	01	14	
UL0128	Friction plate	02	15	
WL0175	Washer M6x18x1.6	01	16	
WJ0171	Nyloc nut	01	17	
UJ0220	Ties	05	18	
FD0190	Decausing coil holder	23	19	
SE2715	Ground wire	05	20	
SE2651	Ground wire	06	21	
SE2691	Ground spring	03	22	

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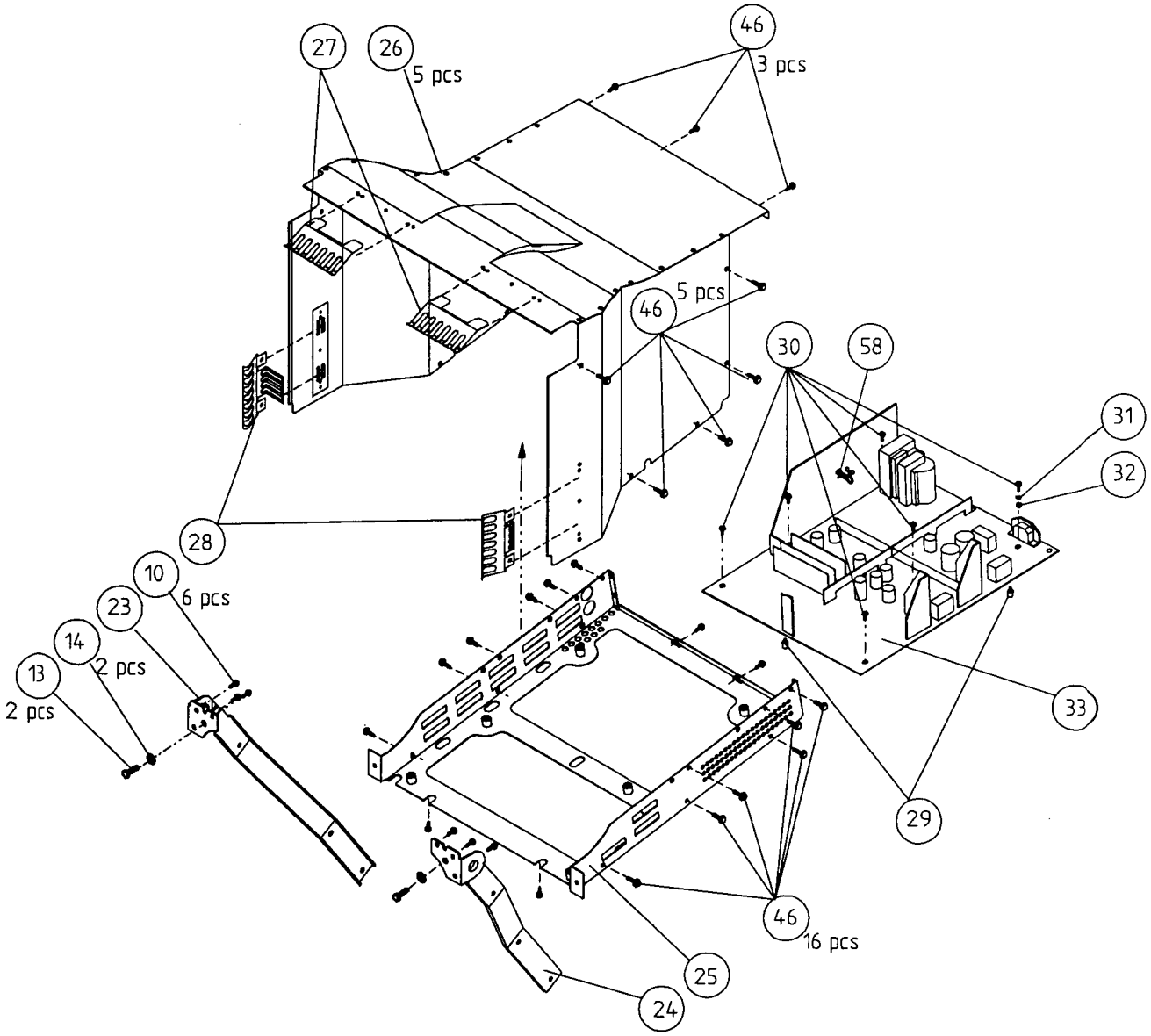
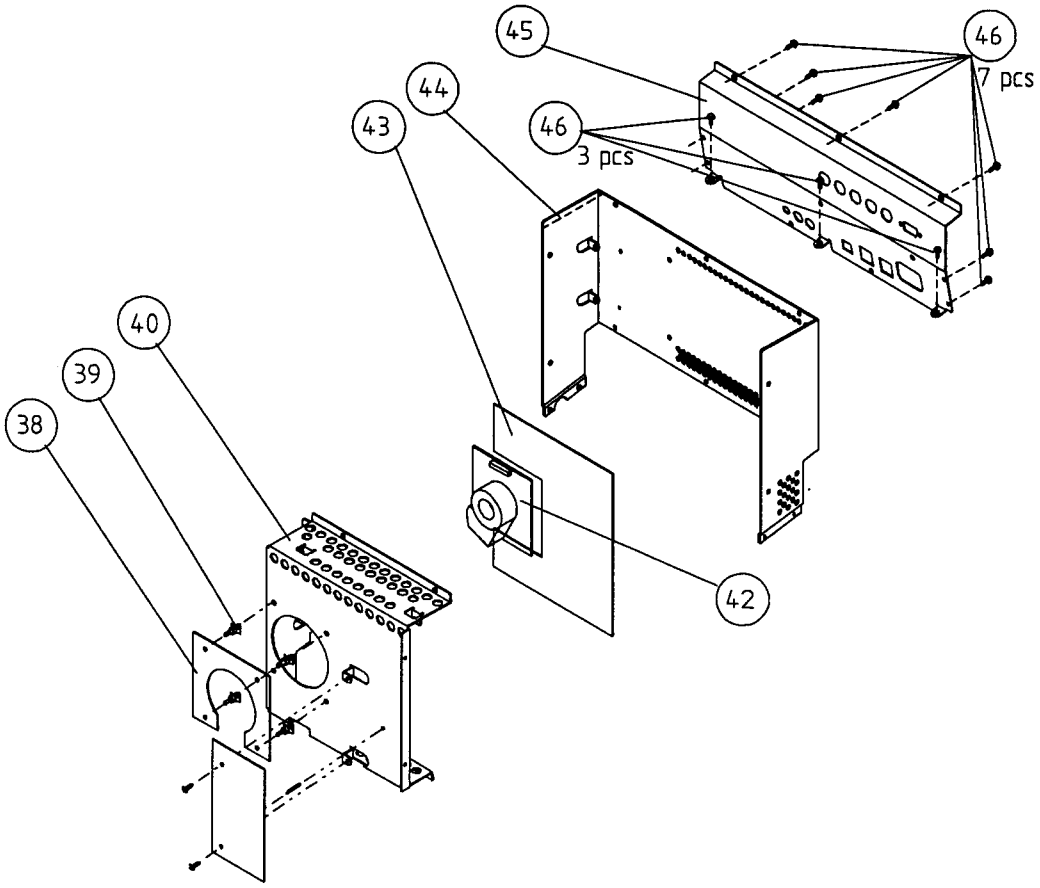


Part Number	Description	PG	Item Number	Model
WC0353	Screw KB 40x10 WN1447	01	10	
UC6916	Hexagon screw DIN933 M6x20SFS2064	08	13	
UL0131	Friction plate	01	14	
UC6917	Side support Left	09	23	
UC6918	Side support Right	09	24	
UC6939	Bottom plate	17	25	
UC6945	Cover assembly	23	26	
UC6882	Grounding spring	03	27	
UC6900	Grounding spring, side	04	28	
UG0778	Support pin	01	29	
WA0749	Screw M4x8	01	30	
WL0217	Washer 4.3 ST	01	31	
UC6781	Washer	04	32	
SMA209	Main board	62	33	
WC0036	Hexagon torx10 tapping screw 3.5x9.5 Zn	01	46	
UJ0251	Ties	04	58	



Part Number	Description	PG	Item Number	Model
SMX001	Moire board	21	38	
UG1004	Support button	03	39	
UC6942	Videobox	13	40	
SMH148	CRT board (Included in SMY)	*	42	
SMY042	Video board	42	43	
UC6914	Rear plate	16	44	
UC6914	Connector panel	16	45	

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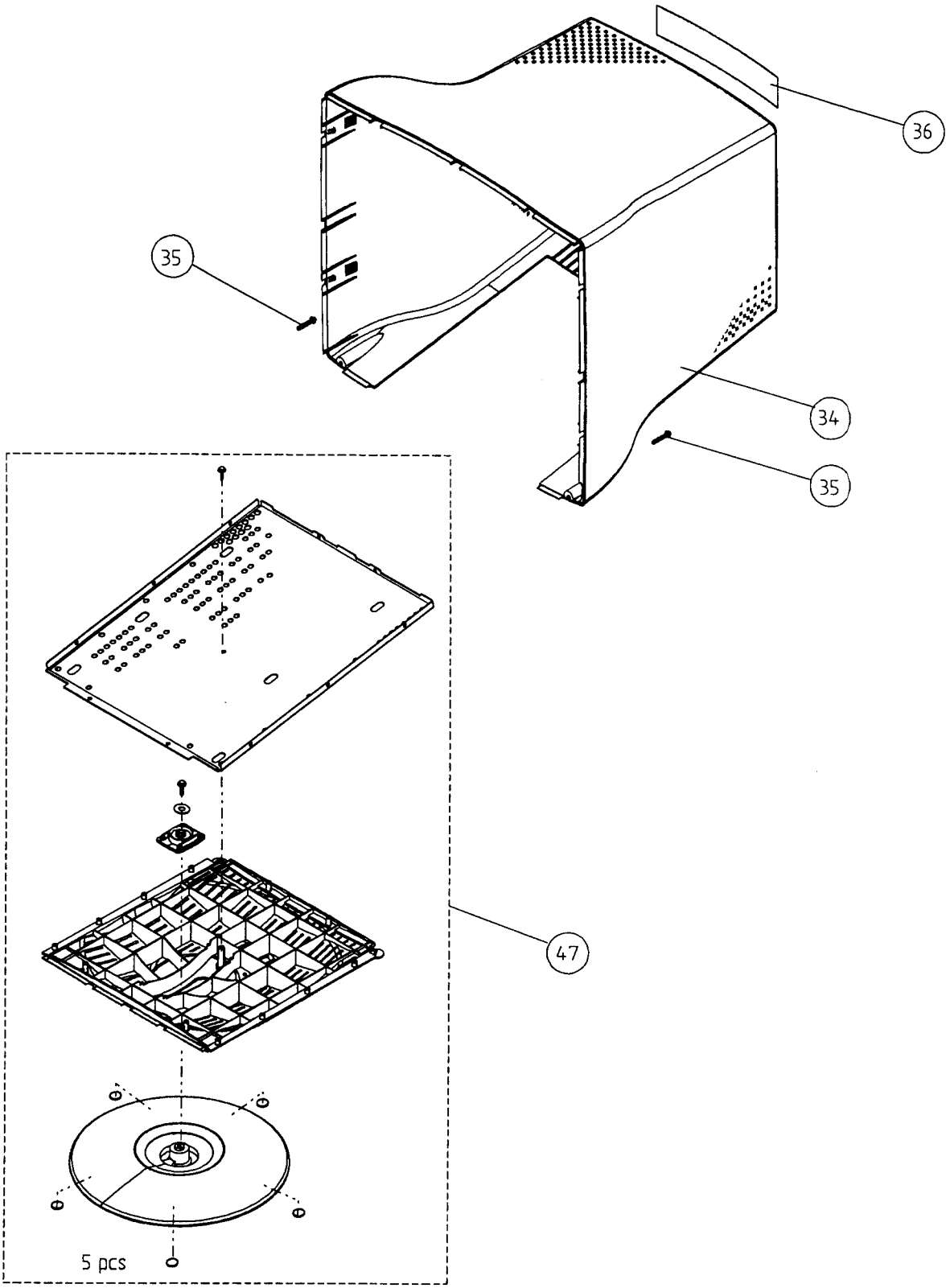

Part Number	Description	PG	Item Number	Model
UD0640	Rear cover	25	34	
WC0354	Pt-screw KB 40x10 WN1447 FE/ZN yellow	05	35	
ZZ2818	Label set	12	36	
UDX101	Stand assembly	25	47	

Part Number	Description	PG	Item Number	Model
Cables:				
QM0028	Power Cord 3*1,0MM2 L=2,5M Grey	18	051	
QM0049	Power Cord 3*18AWG L=1,8M RAL0732	18	059	
QM0300	Signal cable VGA-51	25		
Packing Materials:				
ZA1895	Packing Support L/R 447G	19		
ZA2560	Packing Box PN10196	20		
ZA0453	Plasticbag 230x320 Salpap73050726	02		
Adapters:				
QK1518	Multimode MacAdapter	17	059	
Documents:				
ZF5752	Use guide NOKIA 446A EN FR SP	12		
ZF5753	Use guide NOKIA 446A GE IT SW FI	13	051	
ZF5683	Warranty Card NOKIA USA Colorfic	02	059	
ZF5737	TCO95 Leaflet	02		
ZK0005	Nokia W95 Setup 3.5"	08		

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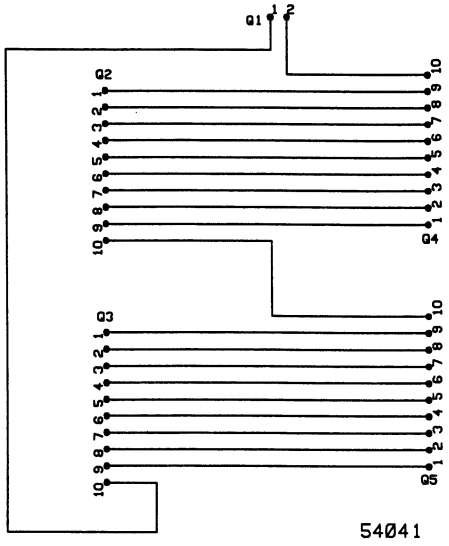
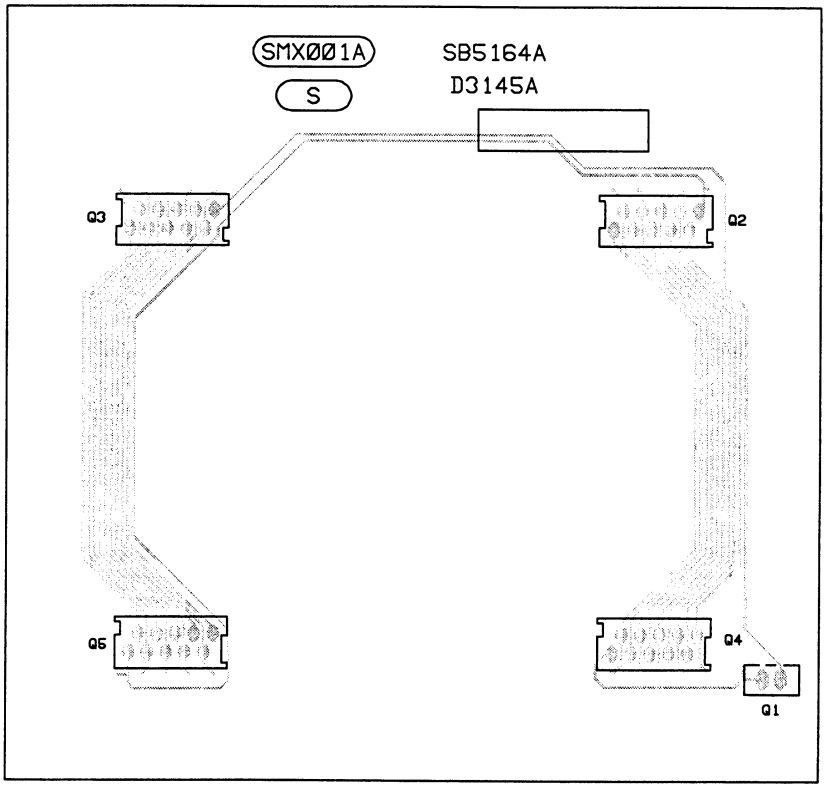
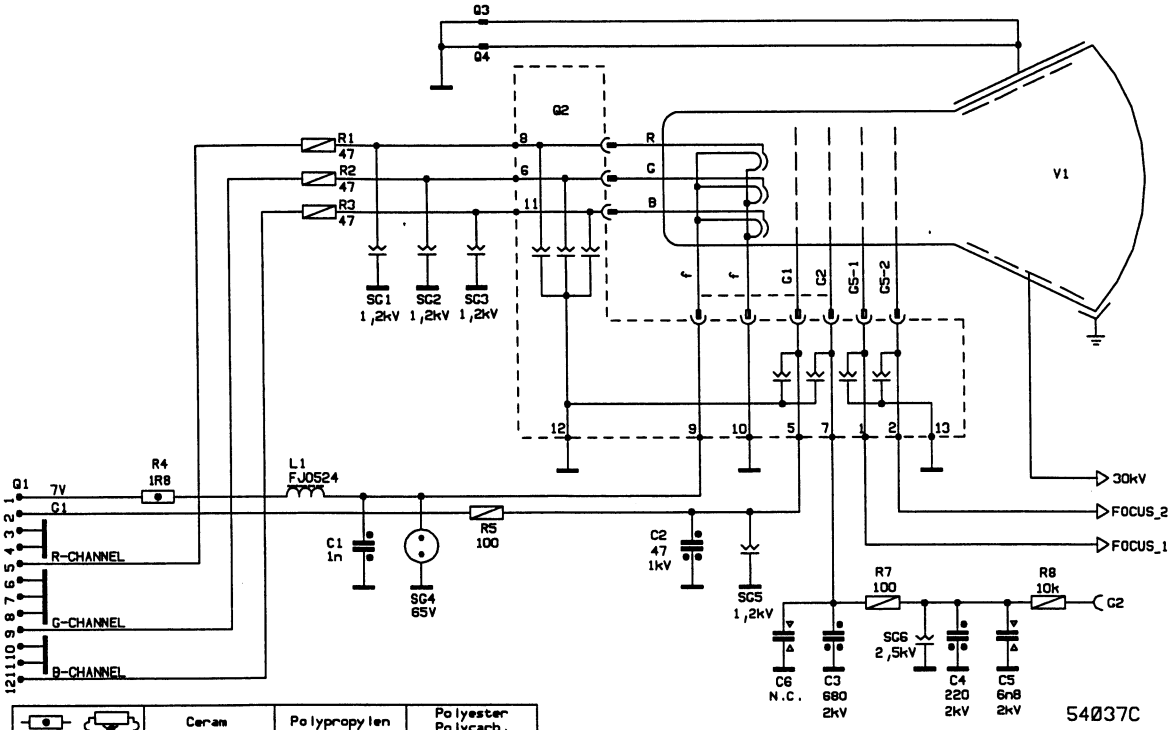
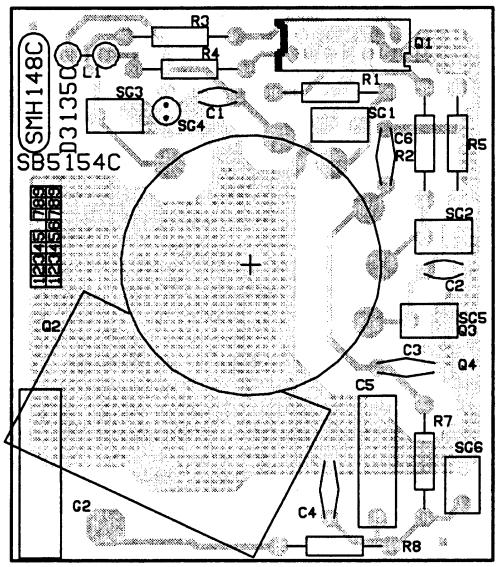




Part Number	Description	PG	Item Number
QK1132	ROW CONN 1X02 2,5 VERT LOCK	02	
QM1033	PICOFLEX ASSY BI-BI 10-POS 150MM	07	



	Ceram	Polypropylen	Polyester Polycarb.
	<= 63V	<= 63V	100V
1/4W	160V	160V	160V
1/2W	250V	250V	250V
1W	500V	500V	400V
2W	1.5kV	1.5kV	1.5kV



Part Number	Description	PG	Item Number
AB0607	NF RES 0W25 1R8 J 2,5-7 CF	1	RH 004
AD0341	COMPRES 0W5 47R K 4-11	3	RH 001 002 003
AD0349	COMPRES 0W5 100R K 4-11	1	RH 005 007
AD0397	COMPRES 0W5 10K K 4-11	1	RH 008
CA0306	CERCAP Y5T 220P M 2KV Y7,5 D9	2	CH 004
CA0318	CERCAP Y5P 680P M 2KV Y7,5 D10	2	CH 003
CB0539	CERCAP SL 47P K 1KV Y5: D6	3	CH 002
CC0200	CERCAP Y5P 1N0 K 500V Y5: D9	1	CH 001
CE2325	IMPCAP 6N8 J 1K6V Y15 081518	5	CH 005
FJ0524	FERRITE CHOKE	3	LH 001
QK1606	"CRT SOCKET FOR 17"" HITACHI NEAT"	13	QH 002
QK1715	BASE PIN COPPER 2.35X0.25X13.2	2	GH2
QT0002	SPARK GAP 1,2KV +-500V R=5,0MM	3	SGH 001 002 003 005
QT0004	SPARK GAP 2,5KV +-500V R=5,0MM	5	SGH 006
QT0217	GLIMM LAMP 65V 6*16MM	3	SGH 004
QM1008	PICOFLEX ASSY BI-IDC 12-POS 70MM	9	QH 001

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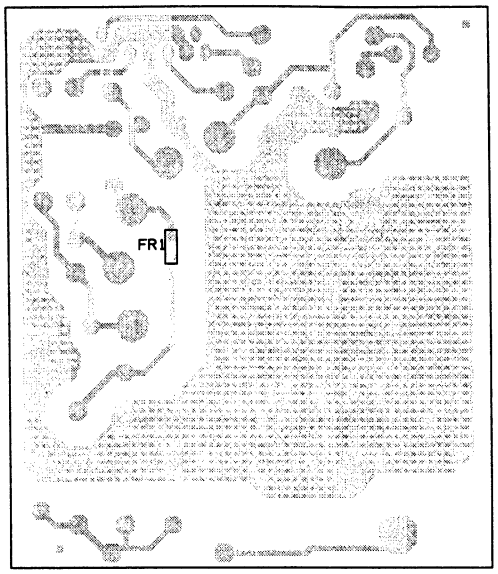

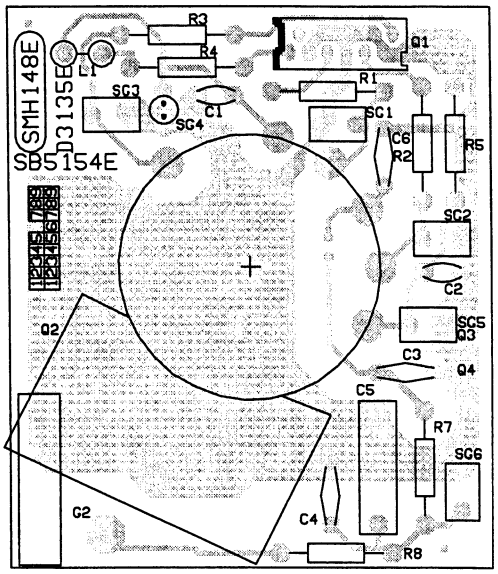

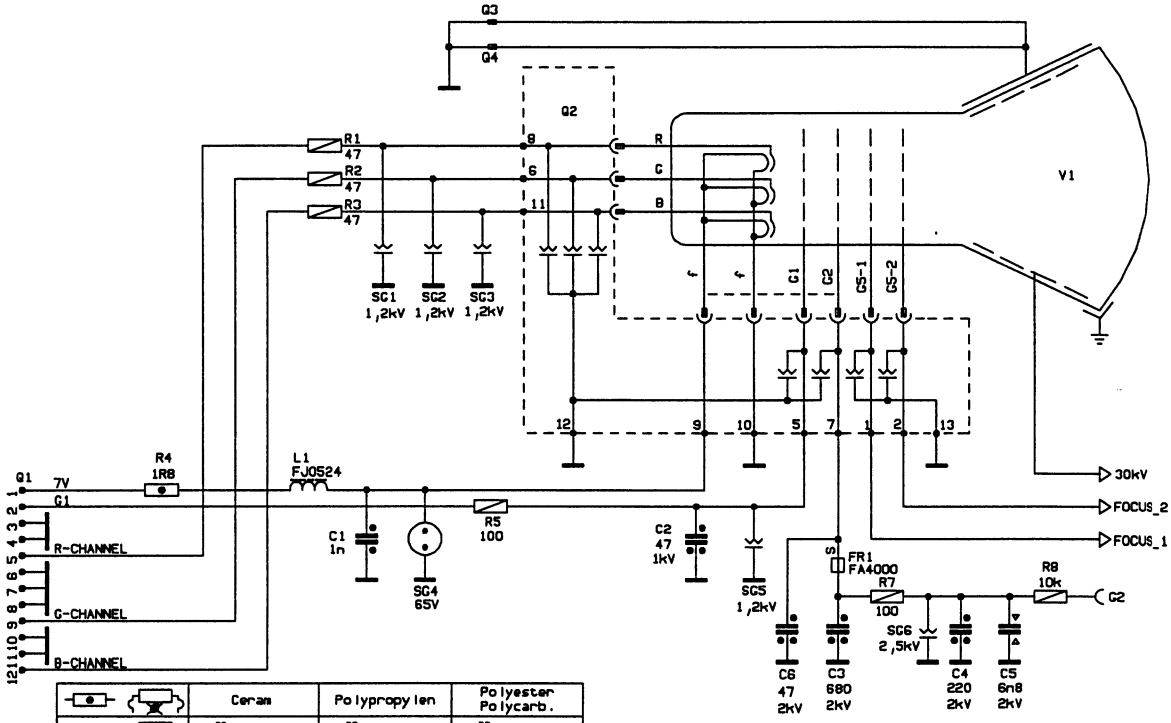

	Ceram	Polypropylen	Polyester Polycarb.
	<= 63V	<= 63V	100V
1/4W	160V	160V	160V
1/2W	250V	250V	250V
1W	500V	500V	400V
2W	1.5kV	1.5kV	1.5kV

ECN
446A19

SMH148E
54Ø37E

Part Number	Description	PG	Item Number
AB0607	NF RES 0W25 1R8 J 2,5-7 CF	1	RH 004
AD0341	COMPRES 0W5 47R K 4-11	3	RH 001 002 003
AD0349	COMPRES 0W5 100R K 4-11	1	RH 005 007
AD0397	COMPRES 0W5 10K K 4-11	1	RH 008
CA0306	CERCAP Y5T 220P M 2KV Y7,5 D9	2	CH 004
CA0315	*NEW*P Y5V 47P J 2KV Y7,5 D6	4	CH 006
CA0318	CERCAP Y5P 680P M 2KV Y7,5 D10	2	CH 003
CB0539	CERCAP SL 47P K 1KV Y5: D6	3	CH 002
CC0200	CERCAP Y5P 1N0 K 500V Y5: D9	1	CH 001
CE2325	IMPCAP 6N8 J 1K6V Y15 081518	5	CH 005
FA4000	CHIP INDUCTOR 600OHM 200MA 0805	1	FRH 001
FJ0524	FERRITE CHOKE	3	LH 001
QK1606	"CRT SOCKET FOR 17"" HITACHI NEAT"	13	QH 002
QK1715	BASE PIN COPPER 2.35X0.25X13.2	2	G2
QT0002	SPARK GAP 1,2KV +-500V R=5,0MM	3	SGH 001 002 003 005
QT0004	SPARK GAP 2,5KV +-500V R=5,0MM	5	SGH 006
QT0217	GLIMM LAMP 65V 6*16MM	3	SGH 004
QM1008	PICOFLEX ASSY BI-IDC 12-POS 70MM	9	QH 001
UC6895	CRT BOARD SPRING 447K	2	

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Part Number	Description	PG	Item Number
AA0633	CF RES 0W25 22R J 2,5-7	01	RY 111 211 311
AA0649	CF RES 0W25 100R J 2,5-7	01	RY 013 026 081 084 103 303
AA0659	CF RES 0W25 270R J 2,5-7	01	RY 124 224 324
AA0665	CF RES 0W25 470R J 2,5-7	01	RY 076
AA0667	CF RES 0W25 560R J 2,5-7	01	RY 105 205 305
AA0673	CF RES 0W25 1K0 J 2,5-7	01	RY 043 045 112 212 312
AA0697	CF RES 0W25 10K J 2,5-7	01	RY 012
AA0707	CF RES 0W25 27K J 2,5-7	01	RY 060
AA0713	CF RES 0W25 47K J 2,5-7	01	RY 077
AA0729	CF RES 0W25 220K J 2,5-7	01	RY 078
AA0737	CF RES 0W25 470K J 2,5-7	01	RY 127 227 327
AC3584	CHIPRES 0W1 75R 1% 0805 2013	01	RY 101 201 301
AC4419	CHIPRES 0W1 5R6 5% 0805 2013	01	RY 015
AC4425	CHIPRES 0W1 10R 5% 0805 2013	01	RY 114 115 116 117 214 215 216 217 314 315
AC4425	CHIPRES 0W1 10R 5% 0805 2013	01	RY 316 317
AC4433	CHIPRES 0W1 22R 5% 0805 2013	01	RY 030
AC4441	CHIPRES 0W1 47R 5% 0805 2013	01	RY 056 058 059
AC4447	CHIPRES 0W1 82R 5% 0805 2013	01	RY 122 222 322
AC4449	CHIPRES 0W1 100R 5% 0805 2013	01	RY 004 005 006 007 019 025 203 031 032
AC4449	CHIPRES 0W1 100R 5% 0805 2013	01	RY 033 034 035 036 037 041 042 075 401 402
AC4449	CHIPRES 0W1 100R 5% 0805 2013	01	RY 403 404
AC4453	CHIPRES 0W1 150R 5% 0805 2013	01	RY 121 221 321
AC4461	CHIPRES 0W1 330R 5% 0805 2013	01	RY 123 223 323
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	01	RY 044 071 128 131 136 002 228 231 236
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	01	RY 328 331 336
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	01	RY 022 072 133 233 333 023
AC4485	CHIPRES 0W1 3K3 5% 0805 2013	01	RY 029
AC4487	CHIPRES 0W1 3K9 5% 0805 2013	01	RY 009
AC4489	CHIPRES 0W1 4K7 5% 0805 2013	01	RY 055
AC4491	CHIPRES 0W1 5K6 5% 0805 2013	01	RY 014 016 021
AC4493	CHIPRES 0W1 6K8 5% 0805 2013	01	RY 113 213 313
AC4497	CHIPRES 0W1 10K 5% 0805 2013	01	RY 135 235 335 027 028
AC4505	CHIPRES 0W1 22K 5% 0805 2013	01	RY 008
AC4513	CHIPRES 0W1 47K 5% 0805 2013	01	RY 010 049 051 053 046 047 048 057
AC4515	CHIPRES 0W1 56K 5% 0805 2013	01	RY 017
AC4517	CHIPRES 0W1 68K 5% 0805 2013	01	RY 003
AC4521	CHIPRES 0W1 100K 5% 0805 2013	01	RY 074 134
AC4523	CHIPRES 0W1 120K 5% 0805 2013	01	RY 126 225 226 326
AC4529	CHIPRES 0W1 220K 5% 0805 2013	01	RY 082 083 234 325
AC4531	CHIPRES 0W1 270K 5% 0805 2013	01	RY 125
AC4537	CHIPRES 0W1 470K 5% 0805 2013	01	RY 001 024
AC8745	CHIPRES 0W12 1M0 J 1206 3216	01	RY 130 230 330
AC8799	CHIPRES 0W12 0R0 JUMPER 1206	01	LY 220
AG3285	MF RES 0W5 75R0 F TC50 2,5-7	01	RY 102 202 302
AG3381	MF RES 0W5 681R F TC50 2,5-7	01	RY 073
AG3433	MF RES 0W5 2K15 F TC50 2,5-7	01	RY 129 229 329
AG3530	MF RES 0W5 20K0 F TC50 2,5-7	01	RY 050 052 054
AG3565	MF RES 0W5 46K4 F TC50 2,5-7	01	RY 132 232 332
CB3133	CHIPCERCAP NP0 22P 50V J 0805	01	CY 122
CB3135	CHIPCERCAP NP0 27P 50V J 0805	01	CY 121 221 321 222
CB3137	CHIPCERCAP NP0 33P 50V J 0805	01	CY 023 024 026 031 032 322
CB3141	CHIPCERCAP NP0 47P 50V J 0805	01	CY 052
CB3167	CHIPCERCAP NP0 470P 50V J 0805	02	CY 001
CB3175	CHIPCERCAP NP0 1N0 50V J 0805	03	CY 089
CB3639	CHIPCERCAP NP0 10P 100V J 0805	01	CY 120 220 320
CC0110	CERCAP Y5P 150P K 500V Y5: D8	01	CY 123 223 323
CC0200	CERCAP Y5P 1N0 K 500V Y5: D9	01	CY 082 084 092 094 126 226 326 093
CC0204	CERCAP Y5P 1N0 K 50V Y5: D6	01	CY 086 020 211
CC0853	CERCAP Z5V 100N Z 25V Y5: D9	01	CY 111
CC3320	CHIPCERCAP X7R 10N 10% 50V 0805	01	CY 021
CC3480	CHIP CERCAP X7R 10% 100N 25V 0805	02	CY 002 004 006 007 008 009 010 011 012 013
CC3480	CHIP CERCAP X7R 10% 100N 25V 0805	02	CY 015 016 017 018 019 022 027 029 041 042
CC3480	CHIP CERCAP X7R 10% 100N 25V 0805	02	CY 071 312 401 402 112 051
CK0283	PESCAP MKT 100N K 250V Y5 070812	02	CY 125 225 325
CK0465	PESCAP MKT 1U0 K 250V Y15 091818	04	CY 124 224 324
CK2784	PESCAP MKT 470N K 63V Y5: 051008	03	CY 103 203 303
CN0308	ELCAP 10U M 50V RM5 : 6*12	01	CY 101 102 201 202 301 302
CN0379	ELCAP' 22U M 100V RM5 :105'11*14	02	CY 091
CN2017	ELCAP 1U0 M 50V RM5: 105' 6X12	02	CY 003
CN2032	ELCAP 10U M 50V RM5: 105' 6X12	01	CY 085 014 028 030 072 090
CN2461	ELCAP- 47U M 100V RM5 105, 10X16	04	CY 083
CN2476	ELCAP 47U M 250V RM7,5 105'17X26	09	CY 081
CN2642	ELCAP 470U M 16V RM5: 105' 11X21	04	CY 087
CN2712	ELCAP 1000U M 16V RM5: 105'11X21	05	CY 005
FA0008	CHIP COIL 68NH 10% SIZE 1210	04	LY 320
FA0027	CHIP COIL 47NH 10% SIZE 1210	04	LY 120
FJ0448	CHOKE 13UH FERRITE 2X15	02	LY 084
FJ0505	CHOKE 15UH 5% TAPED AXIAL	02	LY 081 082 083 085 086
FJ0516	CHOKE 1MH 5% TAPED AXIAL	02	LY 021
JF0025	DI 1N4148 75V 200MA 4N	01	DY 103
JF0067	DI 1N4007 1000V 1A	01	DY 081
JF4003	DI BAV103 200V 250MA 50NS SOD-80	07	DY 120 121 122 123 220 221 222 223 320 321
JF4003	DI BAV103 200V 250MA 50NS SOD-80	07	DY 322 323
JF4005	DI LL4148 75V 150MA 4N (JF4006)	01	DY 020 021 041 044 101 102 104 111 112 201
JF4005	DI LL4148 75V 150MA 4N (JF4006)	01	DY 202 203 204 211 212 301 302 303 304 311
JF4005	DI LL4148 75V 150MA 4N (JF4006)	01	DY 312
JH0053	ZDI BZX83C5V6 5.6V 0.5W 5%	01	DZY 401 402 403 404 405 051 052
JH0054	ZDI BZX83C12 12V 0.5W 5%	01	DZY 070

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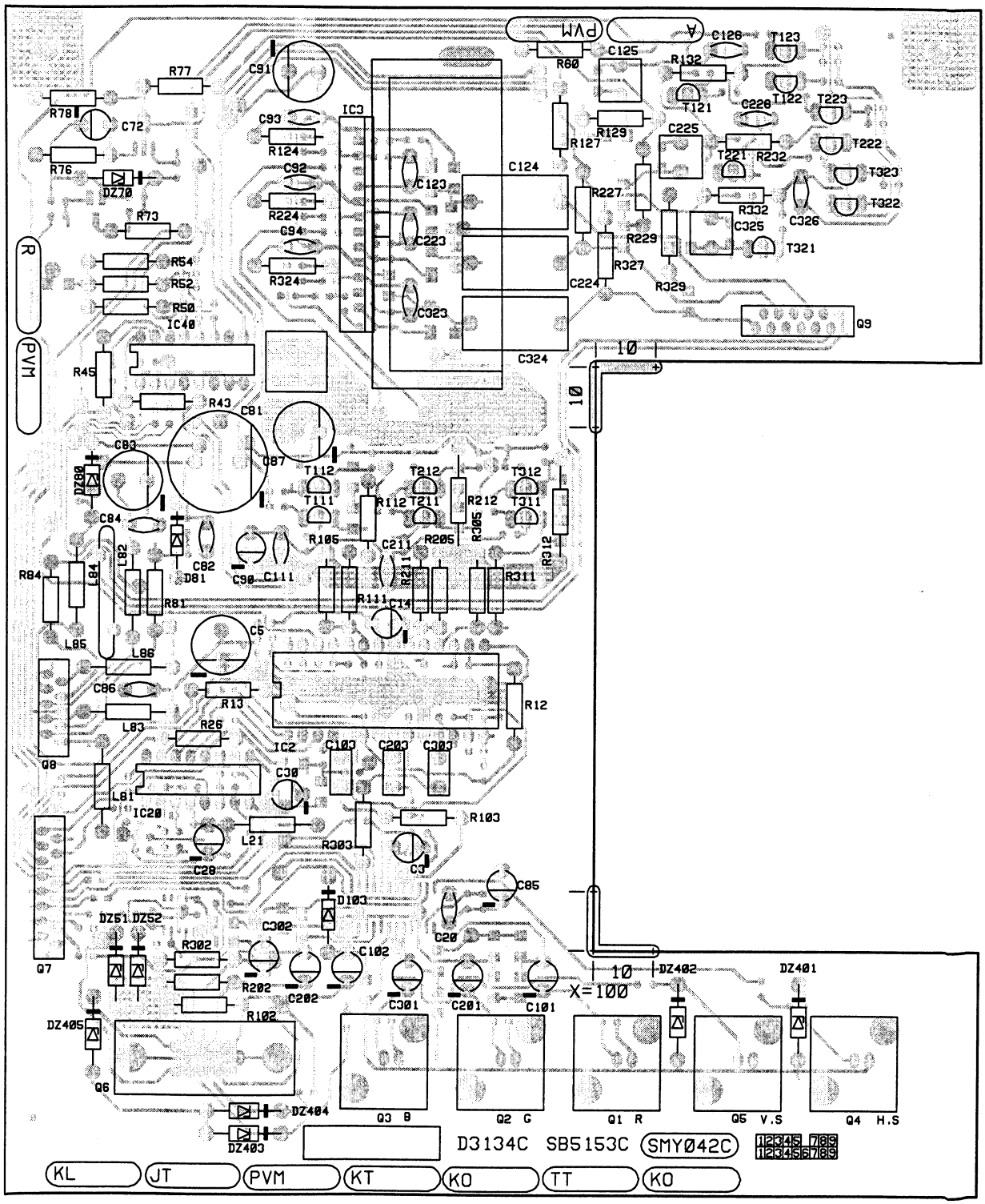
Part Number	Description	PG	Item Number
JH0081	ZDI ZPY 3.9 3.9V 1.3W 5%	01	DZY 080
JM0244	TR BF422 N 250V 25MA 60M:	02	TY 121 122 123 221 222 223 321 322 323
JM0354	TR BFQ131 N 18V 150MA 4GHZ SOT54	04	TY 111 211 311
JM0355	TR BFQ151 P 15V 100MA 3.5G SOT54	05	TY 112 212 312
JM4116	TR PMBT2369 N 15V 200MA SOT-23	03	TY 070
JM4305	TR BST84 N 200V 250MA 250MS SOT89	12	TFY 070
LM0943	IC LM1283N 140MHZ RGB AMP W/OSD	16	ICY 002
LM0961	IC LXC4386P2 OSD WITH OWN CHAR.	21	ICY 020
LM0963	IC CR6927A 150MHZ 3-CH CRT DRIVER	29	ICY 003
LM0968	IC TDA8447 12C BUS 8BIT DAC DIL16	12	ICY 040
LM4420	IC DUAL MODE EEPROM FOR DDC 2.0	12	ICY 050
LM4421	IC BA7657F INPUT SIGNAL SELECTOR	13	ICY 001
QK1522	HIGH DENSITY D-15 CONN. FEM VERT	13	QY 006
QK1562	BNC-CONN FEMALE VERT 75OHM PCB	11	QY 001 002 003 004 005
QK1704	PICOFLEX HEADER 1X10 1,27MM	04	QY 008
QK1707	PICOFLEX HEADER 1X16 1,27MM	04	QY 007
QK1705	PICOFLEX HEADER 1X12 1,27MM	04	QY 009
UC6869	J__HD.LEVY/COOLING PLATE 447S	06	ICY 003
WN0168	RIWSCREW 1712-3510	03	ICY 003
XW0032	L_MP.JOHT.RASVA DOW CORNING	09	ICY 003



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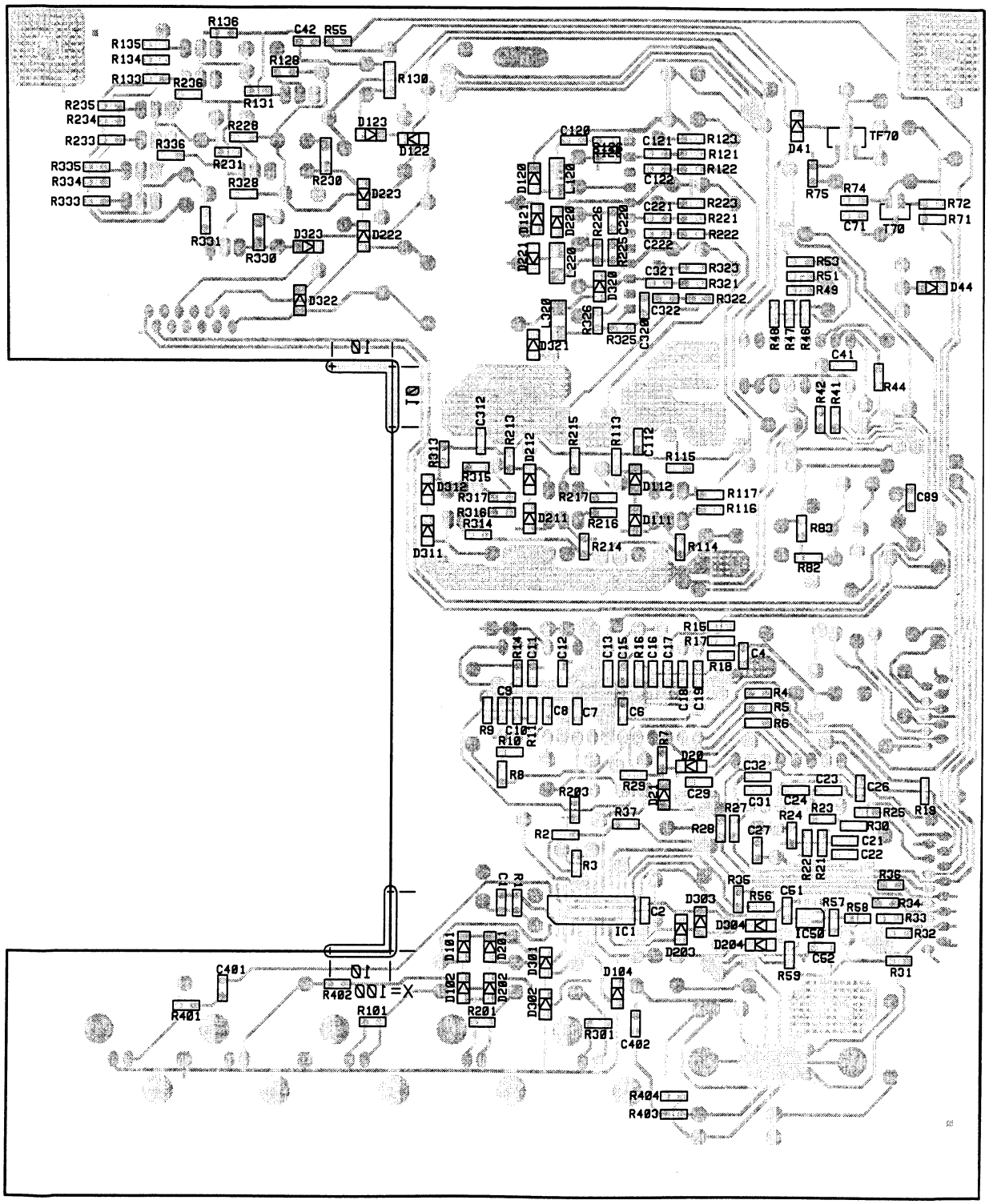

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Part Number	Description	PG	Item Number
AA0633	CF RES 0W25 22R J 2,5-7	01	RA 150 151 152 206 350 353 358 361
AA0641	CF RES 0W25 47R J 2,5-7	01	RA 236 374 377
AA0649	CF RES 0W25 100R J 2,5-7	01	RA 563 569 577 580 581 578
AA0657	CF RES 0W25 220R J 2,5-7	01	RA 225 322 346 348
AA0665	CF RES 0W25 470R J 2,5-7	01	RA 147 431
AA0673	CF RES 0W25 1K0 J 2,5-7	01	RA 148 329 129 209 223 398 420 429 395 396
AA0681	CF RES 0W25 2K2 J 2,5-7	01	RA 514 559 339 391
AA0685	CF RES 0W25 3K3 J 2,5-7	01	RA 411
AA0687	CF RES 0W25 3K9 J 2,5-7	01	RA 430
AA0689	CF RES 0W25 4K7 J 2,5-7	01	RA 378 542 543 544 545 546 547 583 303 382
AA0689	CF RES 0W25 4K7 J 2,5-7	01	RA 212 234 435
AA0697	CF RES 0W25 10K J 2,5-7	01	RA 216 401 421 450
AA0699	CF RES 0W25 12K J 2,5-7	01	RA 505
AA0705	CF RES 0W25 22K J 2,5-7	01	RA 512 573 230
AA0717	CF RES 0W25 68K J 2,5-7	01	RA 138 139
AA0721	CF RES 0W25 100K J 2,5-7	01	RA 459
AA0723	CF RES 0W25 120K J 2,5-7	01	RA 449
AA0725	CF RES 0W25 150K J 2,5-7	01	RA 324 448
AA0729	CF RES 0W25 220K J 2,5-7	01	RA 228
AA0731	CF RES 0W25 270K J 2,5-7	01	RA 414
AA0737	CF RES 0W25 470K J 2,5-7	01	RA 439 221 104 105 106 107
AA0745	CF RES 0W25 1M0 J 2,5-7	01	RA 440 441
AA0754	CF RES 0W25 2M2 J 2,5-7	01	RA 385 388
AA0755	CF RES 0W25 2M7 J 2,5-7	01	RA 390
AA0761	CF RES 0W25 4M7 J 2,5-7	01	RA 102 103 334 229
AB0585	NF RES 0W25 0R22 J 2,5-7 CF	01	RA 463 464
AB0609	NF RES 0W25 2R2 J 2,5-7 CF	01	RA 281
AB0625	NF RES 0W25 10R J 2,5-7 CF	01	RA 127
AB0649	NF RES 0W25 100R J 2,5-7 CF	01	RA 125
AB0795	NF RES 0W5 0R56 J 4-11 CF	02	RA 130 131 132 153 405 406
AC3366	CHIPRES 5K90 0W1 1% 0805	01	RA 272 277
AC3388	CHIPRES 10K0 0W1 1% 0805	01	RA 270
AC4409	CHIPRES 0W1 2R2 5% 0805 2013	01	RA 202
AC4425	CHIPRES 0W1 10R 5% 0805 2013	01	RA 407 427 442 443 222
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	01	FRA 502 503 506 507 508 511 514 515 517 518
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	01	JA 808
AC4433	CHIPRES 0W1 22R 5% 0805 2013	01	RA 309 310 316
AC4449	CHIPRES 0W1 100R 5% 0805 2013	01	RA 164 305 422 452 453 454 455 456 457
AC4449	CHIPRES 0W1 100R 5% 0805 2013	01	RA 458 527
AC4455	CHIPRES 0W1 180R 5% 0805 2013	01	RA 347 355 371
AC4457	CHIPRES 0W1 220R 5% 0805 2013	01	RA 155 317 354 356 370 372 526
AC4465	CHIPRES 0W1 470R 5% 0805 2013	01	RA 154 349 156 232 373 376 529 352 365 368
AC4465	CHIPRES 0W1 470R 5% 0805 2013	01	RA 357 360 433
AC4467	CHIPRES 0W1 560R 5% 0805 2013	01	RA 521
AC4471	CHIPRES 0W1 820R 5% 0805 2013	01	RA 337
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	01	RA 109 141 238 161 210 326 336 404 338 548
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	01	RA 528 531 549 451 118 425
AC4479	CHIPRES 0W1 1K8 5% 0805 2013	01	RA 217
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	01	RA 128 158 167 121 306 314 327 426 552
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	01	RA 553 566 575
AC4483	CHIPRES 0W1 2K7 5% 0805 2013	01	RA 536 537 538 539 540 541 582
AC4489	CHIPRES 0W1 4K7 5% 0805 2013	01	RA 133 237 304 313 444 445 218 120 564
AC4489	CHIPRES 0W1 4K7 5% 0805 2013	01	RA 530 532 535 550 551 562 574
AC4491	CHIPRES 0W1 5K6 5% 0805 2013	01	RA 511
AC4493	CHIPRES 0W1 6K8 5% 0805 2013	01	RA 201
AC4497	CHIPRES 0W1 10K 5% 0805 2013	01	RA 112 113 157 160 162 163 226
AC4497	CHIPRES 0W1 10K 5% 0805 2013	01	RA 224 510 301 302 311 328
AC4497	CHIPRES 0W1 10K 5% 0805 2013	01	RA 330 331 384 403 460 567 576
AC4497	CHIPRES 0W1 10K 5% 0805 2013	01	RA 584 501 205 408 504 554 211
AC4501	CHIPRES 0W1 15K 5% 0805 2013	01	RA 122
AC4505	CHIPRES 0W1 22K 5% 0805 2013	01	RA 110 111 116 115 231 393 399 517
AC4505	CHIPRES 0W1 22K 5% 0805 2013	01	RA 402 410 520 233 409 235
AC4509	CHIPRES 0W1 33K 5% 0805 2013	01	RA 168 159
AC4511	CHIPRES 0W1 39K 5% 0805 2013	01	RA 119
AC4513	CHIPRES 0W1 47K 5% 0805 2013	01	RA 203 208 558 386 387 502 503 519
AC4519	CHIPRES 0W1 82K 5% 0805 2013	01	RA 335
AC4521	CHIPRES 0W1 100K 5% 0805 2013	01	RA 135 412 413 518 525
AC4523	CHIPRES 0W1 120K 5% 0805 2013	01	RA 108
AC4529	CHIPRES 0W1 220K 5% 0805 2013	01	RA 136
AC4537	CHIPRES 0W1 470K 5% 0805 2013	01	RA 227 522 394 515 516 561
AC4547	CHIPRES 0W1 1M2 5% 0805 2013	01	RA 123 124
AC4549	CHIPRES 0W1 1M5 5% 0805 2013	01	RA 137
AC4553	CHIPRES 0W1 2M2 5% 0805 2013	01	RA 389
AC4561	CHIPRES 0W1 4M7 5% 0805 2013	01	RA 140 214
AC4569	CHIPRES 0W1 10M 5% 0805 2013	01	RA 533
AD0349	COMPRES 0W5 100R K 4-11	01	RA 321
AD0373	COMPRES 0W5 1K0 K 4-11	01	RA 332
AD0397	COMPRES 0W5 10K K 4-11	01	RA 333
AD0445	COMPRES 0W5 1M0 K 4-11	01	RA 101
AG3101	MF RES 0W5 1R00 F TC200 2,5-7	01	RA 145 146 279 432
AB0785	NF RES 0W5 0R22 J 4-11 CF	02	RA 318
AG3119	MF RES 0W5 1R54 F TC200 2,5-7	01	RA 424
AG3133	MF RES 0W5 2R15 F TC200 2,5-7	01	RA 423 462
AG3165	MF RES 0W5 4R64 F TC200 2,5-7	01	RA 434
AG3233	MF RES 0W5 21R5 F TC50 2,5-7	01	RA 437
AG3273	MF RES 0W5 56R2 F TC50 2,5-7	01	RA 315
AG3301	MF RES 0W5 100R F TC50 2,5-7	01	RA 341 392
AG3343	MF RES 0W5 274R F TC50 2,5-7	01	RA 280
AG3465	MF RES 0W5 4K64 F TC50 2,5-7	01	RA 134 446 447
AG3477	MF RES 0W5 6K19 F TC50 2,5-7	01	RA 204

Part Number	Description	PG	Item Number
AG3489	MF RES 0W5 8K25 F TC50 2,5-7	01	RA 307
AG3501	MF RES 0W5 10K0 F TC50 2,5-7	01	RA 271 165
AG3519	MF RES 0W5 15K4 F TC50 2,5-7	01	RA 461
AG3557	MF RES 0W5 38K3 F TC50 2,5-7	01	RA 308
AG3609	MF RES 0W5 121K F TC50 2,5-7	01	RA 323
AG3619	MF RES 0W5 154K F TC50 2,5-7	01	RA 149
AJ2523	MO RES 2W0 10R J 6-17	02	RA 428
AJ2763	MO RES 2W0 100R J 6-17	02	RA 351 359 375 436
AJ2863	MO RES 2W0 270R J 6-17	02	RA 142 144
AJ3425	MO RES 4W0 56K J 9-22	02	RA 126
AQ2214	TPMET.AA H10 1K0 RM 5X10 6-HOLE	03	RTA 401
AQ2347	TPMET. H10 10K RM 5X10 6-HOLE	04	RTA 101
AQ2219	TPMET.AA H10 47K RM 5X10 6-HOLE	03	RTA 301
AW0079	PTC-THERMISTOR 18R/25'C RM5	07	PTCA 002
AW0111	NTC-THERMISTOR 5R0/25'C RM5+2,5	07	NTCA 001
QH0065	RELAY PCB-MOUNTING 12V 5A/250V	12	REA 001
CA0324	CERCAP Y5P 100P K 1KV Y5 D8 L	02	CA 148 150 154 323 425 446
CB0418	CERCAP N150 22P J 500V Y5: D8	01	CA 532
CC0130	CERCAP Y5P 220P K 500V Y5: D8	01	CA 424
CC0170	CERCAP Y5P 470P K 500V Y5: D8	01	CA 419
CC0240	CERCAP Y5P 2N2 K 500V Y5: D9	01	CA 120 157 318 322 426
CC0513	CERCAP Y5V 3N3 S 1KV Y7,5 D14	02	CA 109 110 111 112 410
CC0530	CERCAP Z5U 4N7 S 500V Y5: D9	01	CA 162
CE0081	X2-CAP 220N K 250VAC Y20 121725	08	CA 100
CE0116	Y-CAP 2N2 M 400VAC Y12,5 SDPJ16	04	CA 101 102 107 108 115
CB3129	CHIPCERCAP NP0 15P 50V J 0805	03	CA 517 518
CB3141	CHIPCERCAP NP0 47P 50V J 0805	01	CA 248 339 533
CB3145	CHIPCERCAP NP0 68P 50V J 0805	01	CA 302 536
CB3151	CHIPCERCAP NP0 100P 50V J 0805	01	CA 124 301 303 313 535
CB3159	CHIPCERCAP NP0 220P 50V J 0805	01	CA 123 427
CB3163	CHIPCERCAP NP0 330P 50V J 0805	01	CA 314 501
CB3167	CHIPCERCAP NP0 470P 50V J 0805	02	CA 122 406
CB3171	CHIPCERCAP NP0 680P 50V J 0805	01	CA 209
CB3175	CHIPCERCAP NP0 1N0 50V J 0805	03	CA 242 308 210 125
CC0530	CERCAP Z5U 4N7 S 500V Y5: D9	01	CA 420
CC3240	CHIPCERCAP X7R 2N2 10% 50V 0805	01	CA 405
CC3260	CHIPCERCAP X7R 3N3 10% 50V 0805	01	CA 249
CC3280	CHIPCERCAP X7R 4N7 10% 50V 0805	01	CA 234 338 415 128
CC3320	CHIPCERCAP X7R 10N 10% 50V 0805	01	CA 126 129 335 204 214
CC3320	CHIPCERCAP X7R 10N 10% 50V 0805	01	CA 241 304 503 404 511 542 553 541 544 543
CC3360	CHIPCERCAP X7R 22N 10% 50V 0805	01	CA 202
CC4400	CHIPCAP X7R 47N K 50V 1206	02	CA 207 208 502
CC4855	CHIPCAP Y5V 100N Z 50V 1206	03	CA 119 132 216 227 232 316 402 436
CC4855	CHIPCAP Y5V 100N Z 50V 1206	03	CA 437 438 439 440 441 442 529 206 218
CE2435	IMPCAP 15N J 400V Y10 061113	03	CA 429
CE2671	IMPCAP 33N J 400V Y15 061118	04	CA 430 443
CE2802	IMPCAP 51N J 400V Y15 081418	03	CA 421 422 423
CE2852	IMPCAP 68N J 400V Y15 081418	04	CA 431
CE2931	IMPCAP 100N J 250V Y15 081418	04	CA 306
CE2964	IMPCAP 150N K 250V Y15 091518	05	CA 432
CE3063	IMPCAP 330N J 250V Y22,5 111928	05	CA 433
CE3163	IMPCAP 680N J 250V Y22,5 112128	07	CA 434
CE3223	"IMPCAP 1U2 J 250V""G""Y22,5 091928"	07	CA 435
CE0522	PCACAP MKC 100N J 63V Y5: 040808	04	CA 413
CE2004	IMPCAP 100P K 1K6V Y15 051118	03	CA 142 147
CE2094	IMPCAP 820P K 1K5V Y15 061218	04	CA 307
CE2196	IMPCAP 2N2 J 2KV Y22,5 081628	06	CA 416 417
CE2671	IMPCAP 33N J 400V Y15 061118	04	CA 418
CG2663	PPRCAP KP 4N7 H 63V Y5: 060808	04	CA 127
CK0165	PESCAP MKT 22N K 630V Y10 061213	02	CA 116 117
CK0341	PESCAP MKT 220N K 100V Y10 051113	03	CA 233
CK1388	PESCAP MKT 10N K 250V Y7,5 040911	02	CA 305 407
CK1546	PESCAP MKT 47N K 100V Y7,5 040911	02	CA 246
CK2545	PESCAP 47N K 63V Y5: 030708	02	CA 312
CK2626	PESCAP MKT 100N K 63V Y5: 030808	02	CA 156 336
CK2663	PESCAP MKT 150N J 63V Y5: 040908	03	CA 225
CK2704	PESCAP MKT 220N K 63V Y5: 040908	03	CA 551
CK2784	PESCAP MKT 470N K 63V Y5: 051008	03	CA 228
CK2864	PESCAP MKT 1U0 K 50V Y5:061108!	05	CA 319 403
CN0118	ELCAP 150U M 400V R10 SNAP 25X40	16	CA 113 114
CN0204	ELCAP 2U2 M 50V RM5 : 6*12	01	CA 320 444 445 509
CN0204	ELCAP 2U2 M 50V RM5 : 6*12	01	CA 519 520 521 523 524 528
CN0819	ELCAP'2200U M 25V RM7,5 105'17X38	05	CA 149 151 155
CN2017	ELCAP 1U0 M 50V RM5: 105' 6X12	02	CA 139 317 515 131 212
CN2027	ELCAP 47U M 50V RM5: 105' 9X12	02	CA 205 226
CN2029	ELCAP 4U7 M 100V RM5: 105' 6X12	03	CA 245
CN2032	ELCAP 10U M 50V RM5: 105' 6X12	01	CA 152 153 158 159 516 401 311
CN2037	ELCAP 10U M 160V RM5 105' 11X21	04	CA 144
CN2461	ELCAP- 47U M 100V RM5 105, 10X16	04	CA 121
CN2543	ELCAP 100U M 50V RM5 105 11X13	02	CA 146 160 161 215 230 428 412 217
CN2546	ELCAP 100UF M 100V RM5 105' 14X21	05	CA 143
CN2553	ELCAP 0U47F M 50V RM5: 105' 6X12	01	CA 211 552
CN2566	ELCAP 4U7F M 50V RM5: 105'6X12MM	02	CA 203
CN2581	ELCAP 220U M 35V RM5 105 11X13	03	CA 229 231
CN3206	ELCAP 10U M 50V RM5 105' 8X14	03	CA 118
CN3250	ELCAP, 47U M 250V RM7,5 105'16X25	05	CA 140 141
CN3312	ELCAP 100U M 250V RM7.5 105'18X36	09	CA 411
CN3402	ELCAP,1000U M 16V RM5 +105'13X34	12	CA 414
FJ0274	CHOKE 1,0UH	02	LA 407
FJ0448	CHOKE 13UH FERRITE 2X15	02	LA 104 105

Part Number	Description	PG	Item Number
FJ0505	CHOKE 15UH 5% TAPED AXIAL	02	LA 103 106
FJ0517	CHOKE 6.8UH 10% TAPED AXIAL	03	LA 101
FJ0724	CHOKE 470UH 10% 5 MM RADIAL	08	LA 405
FJ0725	BEAD INDUCTOR MIN IMP360HM	02	FRA 401 402 501 504 505 509 510 512 513 516
FJ0725	BEAD INDUCTOR MIN IMP360HM	02	FRA 519 520 521
FJ0730	LEAD INDUCTOR 270UH 10%	05	LA 406
FJ0733	LEAD INDUCTOR 56UH 10 %	07	LA 401 402
FJ0800	EMI/RFI CHOKE 60MH 3A(AC)	14	MA 101
FM0636	FLYBACK TRAFO 30..120KHZ 445T	38	MA 301
FJ1826	INPUT CHOKE E30/7 2X6,9 MH	12	MA 102 103
FM2560	DYNAMIC FOCUS TRAFO E20/6 445R	12	MA 404
FM2569	CENTERING COIL E30/7 1.32UH 445T	12	MA 403
FM2570	DRIVER TRAFO E20/6 N67 17.2U 445T	12	MA 402
FM2571	INPUT TRAFO ETD34 N87 382UH 445T	20	MA 401
FM3505	SMPS-TRAFO ETD49 N67 445T	19	MA 104
FU0725	*NEW*LIN COIL N-S 446A	19	LA 403
FU0726	*NEW*LIN COIL S-N 446A	05	LA 404
JF0025	DI 1N4148 75V 200MA 4N	01	DA 204 208 209 401 402 406 302 303 429 213
JF0025	DI 1N4148 75V 200MA 4N	01	DA 214
JF0060	DI 1N4002 100V 1A	01	DA 207
JF0067	DI 1N4007 1000V 1A	01	DA 129
JF0206	SCHOTTKY RECTIFIER 30V 1A 1N5818	04	DA 405
JF0072	DI BAV21 200V 250MA 50N	01	DA 128 205 315 432
JF0096	DI BYV28-100 100V 3.5A 30N	07	DA 126 413 421 422
JF0166	DIODE BYM26C 600V 2.3A SOD-64	06	DA 122 123
JF0171	DI BYV29-400 400V 8A 50NS TO-220	09	DA 125
JF0032	DI UF4007 1000V 1A 75N DO41/SOD57	04	DA 105 409
JF0033	DI UF5404 400V 3A 50NS	04	DA 127
JF0034	DI UF5406 600V 3A 75N	09	DA 306
JF0073	DI RGP10G 400V 1A 150N	04	DA 418 419 420 427 416 423 424
JF0104	DI BYV27-200 200V 2A 25N SOD57	03	DA 411 412 106 430
JF0107	DI BYV26C 600V 1A 30N	05	DA 426
JF4003	DI BAV103 200V 250MA 50NS SOD-80	07	DA 407 408 431 108
JF4005	DI LL4148 75V 150MA 4N (JF4006)	01	DA 107 109 110 120 121 201 206 210 211 301
JF4005	DI LL4148 75V 150MA 4N (JF4006)	01	DA 304 305 307 316 317 318 403 404 212
JF4005	DI LL4148 75V 150MA 4N (JF4006)	01	DA 504 507 508 417 428 111 130 112 113
JF4011	SCHOTTKY BARRIER 30V 200MA SOT-23	03	DA 202
JF4101	DI RHRD460S 600V 4A 30NS TO-252	08	DA 124 410
JB0044	DI DTV110F 1500V 10A TO220FI	14	DA 414
JB0047	DI GP30M 1000V 3A 3,0US DO201AD	04	DA 101 102 103 104
JH0053	ZDI BZX83C5V6 5.6V 0.5W 5%	01	DZA 101
JH0054	ZDI BZX83C12 12V 0.5W 5%	01	DZA 402 404 405 103
JH0059	ZDI BZX83C8V2 8.2V 0.5W 5%	01	DZA 102
JH0086	ZDI BZX83C4V7 4.7V 0.5W 5%	02	DZA 503
JH0169	ZDI BZX55B3V9 3,9V 0,5W 2%	03	DZA 502
JH0085	ZDI BZX83C22 22V 0.5W 5%	01	DZA 201
JH4118	ZDI BZX84C12 0.225W 5% SOT-23	02	DZA 301
JM0099	TR BC547B N 45V 100A 200M:	01	TA 301 305 307
JM0100	TR BC557B P 45V 100A 200M:	01	TA 115 302 306
JM0202	TR MPSA44 N 400V 300MA TO92	03	TA 101
JM0203	TR MPSA42 N 300V 500MA TO92	03	TA 415 416
JM0205	TR BF423 P 250V 25MA 60M:	03	TA 112
JM0206	TR BF420 N 300V 100MA 60M TO-92:	12	TA 410 417
JM0227	TR MPS2369 N 15V 200MA 500M	03	TA 207
JM0239	TR BC638 P 60V 1A 50M:	04	TA 103 336
JM0244	TR BF422 N 250V 25MA 60M:	02	TA 311 425
JM0252	TR BC639-10 N 100V 1.5A TO92	03	TA 412
JM0273	TR 2N5551 NPN 160V 0,6A	02	TA 104 205 206
JM0280	TR 2N5401 P 150V 0.6A 100M	02	TA 411
JM0285	TR BC637-16 N 40V 1A 60M:	04	TA 339
JM0334	TR BD135 NPN 45V 1A5 250MHZ TO126	04	TA 328 330 334
JM0335	TR BD136 PNP 45V 1A5 250MHZ TO126	04	TA 329 331 335
JM4105	TR BC847B N 45V 0.1A SOT23	02	TA 117 118 203 102 324 337 312 315 316 319
JM4105	TR BC847B N 45V 0.1A SOT23	02	TA 327 404 406 208 508
JM4114	TR BC857B P 45V 100MA 150M:	02	TA 106 107 116 509 426 310 313 314 317
JM4114	TR BC857B P 45V 100MA 150M:	02	TA 318 338 325 326 401 402 407 506
JM0341	TR BUH1215(435B) N 1500V 19ATO218	19	TA 409
JS1006	FET BS170 N 60V 500MA	10	TA 111
JS0019	FET IRF640 N 200V 18A TO220	13	TA 420 421 422 423 424
JS0019	FET IRF640 N 200V 18A TO220	13	TA 418 419
JS0026	FET IRFBC40 N 600V 6.0A TO220 AB	10	TA 403
JS0030	FET IRF620 200V 5A 0.8R TO-220	07	TA 413 414
JS0035	FET IRF820 N 500V 2.5A 3.0R	10	TA 108 113
JS0049	FET 2SJ306 P 250V 3A 1.5R TO220	19	TA 303
JS0051	FET IRF9540 P 100V 19A 0.2R TO220	14	TA 408
JS0062	FET IRFPC50 N 600V 11A OR60 TO247	17	TA 105
JS0063	FET IRFIBE30G N 800V 2,1A 3R0 220	23	TA 304
LM4406	IC LM324 QUAD OP-AMP SO-14	05	ICA 304
LM0893	IC 74HC14N 6XINV.SCHMITT-TRIGGER	05	ICA 502
LM0967	IC SI-3120FA 12V LOWDROP REG 2%	09	ICA 105
LM4111	IC 4538BT	05	ICA 301
LM0067	IC UA7805UC +5V REGULATOR TO-220	13	ICA 104 106
LM4022	IC 74HCT74 DUAL D-FLIP-FLOP SO-14	05	ICA 503
LM4111	IC 4538BT	05	ICA 506
LM0930	IC STV9379 VERT.DEFL.BOOSTER	15	ICA 203
LM0663	IC TL431 VOLTAGE REFERENCE TO-92	06	ICA 103
LM0938	IC ST72E72 MONITOR UC,DDC DIP-56	34	ICA 501
LM0969	*NEW* ST72E75 MONITOR UC DIP56	30	ICA 501
LM0957	IC UC3843 CURR.MODE PWM CON.DIP-8	06	ICA 401
LM0981	IC M24128 EEPROM 128K (16X8) DIL8	19	ICA 504

Part Number	Description	PG	Item Number
LM0959	IC L4990 PRIMARY CONTROLLER DIP16	10	ICA 101
LM0962	IC TDA9106 DEFLECTION PROCESSOR	19	ICA 201
LZ0003	IC-SOCKET 8-POLE DIL SINGLE LEAF	3	ICA 504
LZ0063	IC-SOCKET 56-POLE DUAL LEAF 1.78	10	ICA 501
JL0062	OPTOCOUPLER CNY17F-2 5,3KV	08	ICA 102
SE2530	POWER SYNC. JOHTO 447C	08	MA 301
QK1446	WIRE TERMINAL FOR 1,85MM HOLES	01	002
XS0440	WIRE 2-ISOL 0,32MM2 UL1011 BROWN	05	001
SE2643	WIRE 445R	06	VA 001 002
XS1041	WIRE SOLID 0,81MM UL1032 1K2V 90'	03	
SE2714	CONNECTION WIRE SMX 446A/445Q	05	QA 302
QK0530	WIRE CONN BODY 1X02 2,5 CRIMP	02	003
QK0823	CRIMP CONTACT FOR MKH-SERIE	01	004
XS0451	WIRE SOLID 0,50MM UL1007 RED	02	001
XS0452	WIRE SOLID 0,50MM UL1007 BLACK	02	002
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	01	JA 802 803 804 806 809 810
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	01	JA 811 812 813 815 818 819 820 823
QA0095	CRYSTAL 8,00 MHZ HC-49/U	04	XA 501
QT0002	SPARK GAP 1,2KV +-500V R=5,0MM	03	GLA 302 303
QT0207	GLIMM LAMP 95V 6*12,5MM	04	GLA 301
QT0102	FUSEHOLDER CLIPS 5*20MM R=5,0MM	01	FA 101
QT0775	FUSE 5*20MM T 6,3A 250V 1500A	03	FA 101
QT0733	FUSE R=5,0MM T 3,15A 250V IEC127	04	FA 102
AA0665	CF RES 0W25 470R J 2,5-7	01	RZ 603
AA0697	CF RES 0W25 10K J 2,5-7	01	RZ 607
AC4449	CHIPRES 0W1 100R 5% 0805 2013	01	RZ 608
AC4457	CHIPRES 0W1 220R 5% 0805 2013	01	RZ 604
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	01	RZ 602
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	01	RZ 605 609
AC4465	CHIPRES 0W1 470R 5% 0805 2013	01	RZ 601
AC4499	CHIPRES 0W1 12K 5% 0805 2013	01	RZ 606
AC4513	CHIPRES 0W1 47K 5% 0805 2013	01	RZ 610
AP0191	PMET 10K LIN EVJ02KFB6B14 CCLICK	10	PZ 602 603
JL0058	LED DUALCOLOR RED/GREEN 3 MM	04	LEDZ 601
JL0061	LED GREEN MPG3372X 3MM	03	LEDZ 602 603
JM4105	TR BC847B N 45V 0.1A SOT23	02	TZ 601
JF4005	DI LL4148 75V 150MA 4N (JF4006)	01	DZ 601
QG0329	MINIATURE PUSH SWITCH 0.1A 24VDC	10	SWZ 601 602
QG0401	ENCODER 20PULSE/ 360' WITH SWITCH	14	PZ 601
QK1415	CRIPLET CONN FOR 2-SIDED PCB	01	
QK1285	ROW CONN 1X05 5,08/7,62 VERT/LOCK	03	QA 102
QK1287	PIN STRIP 1X04 8,0/10.0 VERT MALE	03	QA 401
QK1587	COOLING & SUPP.PART FOR RESISTOR	01	RA 126
QK1650	MAINS CONN MALE 90DEG W/PCB SNAPS	08	QA 101
QK1701	PICOFLEX HEADER 1X04 1,27MM	03	QA 504
QK1704	PICOFLEX HEADER 1X10 1,27MM	04	QA 505
QK1730	SHROUDED HEADER 2POS 2,5 JST VER	03	QA 304 305
QK1731	SHROUDED HEADER 3POS 2,5 JST VER	02	QA 301
UC1140	COOLING PLATE PN45154 KUPAR	02	TA 113 303 304 403 408 420
UC1140	COOLING PLATE PN45154 KUPAR	02	TA
UC1140	COOLING PLATE PN45154 KUPAR	02	ICA 104 105 106
UC1140	COOLING PLATE PN45154 KUPAR	02	DA 125
UC6564	COOLINGPLATE PN303153	05	TA 105
UC6564	COOLINGPLATE PN303153	05	ICA 203
UC6647	COOLING PLATE 445X	09	TA 328 329 330 331 334 335
UC6664	COOLING PLATE 445X	14	TA 421 422 423 424
UC6784	COOLING PLATE PN410058 447E	04	DA 124
UC6912	COOLING PLATE 445T	10	TA 409
UC6912	COOLING PLATE 445T	10	DA 414
UC0859	FASTENING SPRING PN44473	02	TA 113 303 304 403 408 420 421 422 423
UC0859	FASTENING SPRING PN44473	02	TA 424
UC0859	FASTENING SPRING PN44473	02	ICA 104 105 106
UC0859	FASTENING SPRING PN44473	02	DA 125
UC6551	FASTENING SPRING	03	DA 414
UC6551	FASTENING SPRING	03	ICA 203
UC6552	FASTENING SPRING	03	TA 105 409
UC6668	FASTENING SPRING TO126	02	TA 328 329 330 331 334 335
UC6743	SUPPORT 447E/H	06	
UC6752	WASHER 447E	01	MA 301
UC6752	WASHER 447E	01	
UC6893	SUPPORT 445P	05	
UJ0125	TIES SST 1 M	01	
JZ0005	SILICONE INSUL. PAD 19*13*0.22MM	01	ICA 203
JZ0018	SILIC/AL INSUL. WITH GLUE 19*13	03	TA 113 403 408 420 421 422 423 424
JZ0018	SILIC/AL INSUL. WITH GLUE 19*13	03	ICA 104 106
JZ0018	SILIC/AL INSUL. WITH GLUE 19*13	03	DA 125
JZ0012	SILICONE INSUL. 22*30*0.22MM	04	TA 105 409
JZ0017	SILICONE INSUL.10X13X0,22 TO-126	02	TA 328 329 330 331 334 335
QM1034	PICOFLEX ASSY BI-IDC 10-POS 120MM	08	QZ 601
QM1035	PICOFLEX ASSY BI-IDC 4-POS 120MM	07	QZ 602
QM1036	PICOFLEX ASSY BI-BI 4-POS 350MM	08	QA 302 303
QM1037	PICOFLEX ASSY BI-IDC 16-POS 650MM	12	QA 502
QM1040	PICOFLEX ASSY BI-IDC 10-POS 510MM	08	QA 501
WC0353	PT-SCR KB 40X10 WN1447 FE/ZN YELL	01	MA 301
WC0446	SCREW 2,9X8 FE/ZN	01	
WC0530	SCREW 2,9X11,5 YELLOW FE/ZN	02	MA 301
XW0032	DOW CORNING	09	TA 105 409
XW0032	DOW CORNING	09	DA 414
XW0032	DOW CORNING	09	ICA 203

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NB. Safety components marked with ⚠ must be replaced with original or approved components only. All printed boards and the back cover are also safety components

DEMA

USB

12V

190V

POWER1 (5)

POWER2 (5)

DEMA (5)

190V

80V

-13_V

-13V

7V

5V

15V

12V

STBY_5V

SUSPEND (2,5)

(2,4,5) UVLO

POWER_OFF (5)

POWER SUPPLY

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

ECN
445T13
445Q05

446A	SMA209
445Q	SMA208
445T	SMA193
56010	

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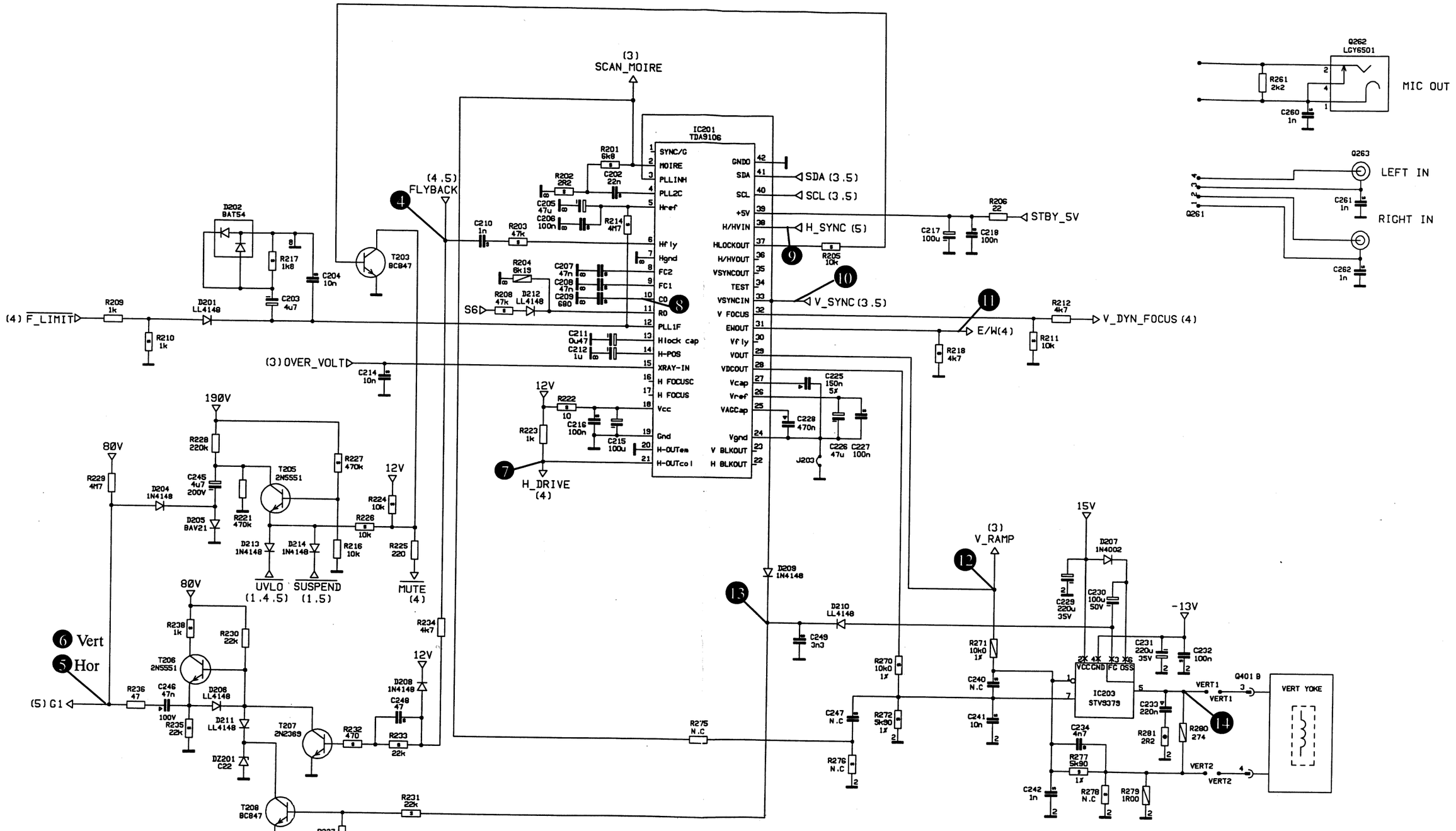

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

VERT. OUTPUT

DEFLECTION PROCESSOR

ECN
445T13
445Q05

446A SMA209
445Q SMA208
445T SMA193
56010

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DYN. KONVERGENCE

TILT

HV GENERATOR

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

ECN
445T13
445Q05

446A	SMA209
445Q	SMA208
445T	SMA193
56010	

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HOR. OUTPUT

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

446A	SMA209
445Q	SMA208
445T	SMA193

56010

ECN
445T13
445Q05

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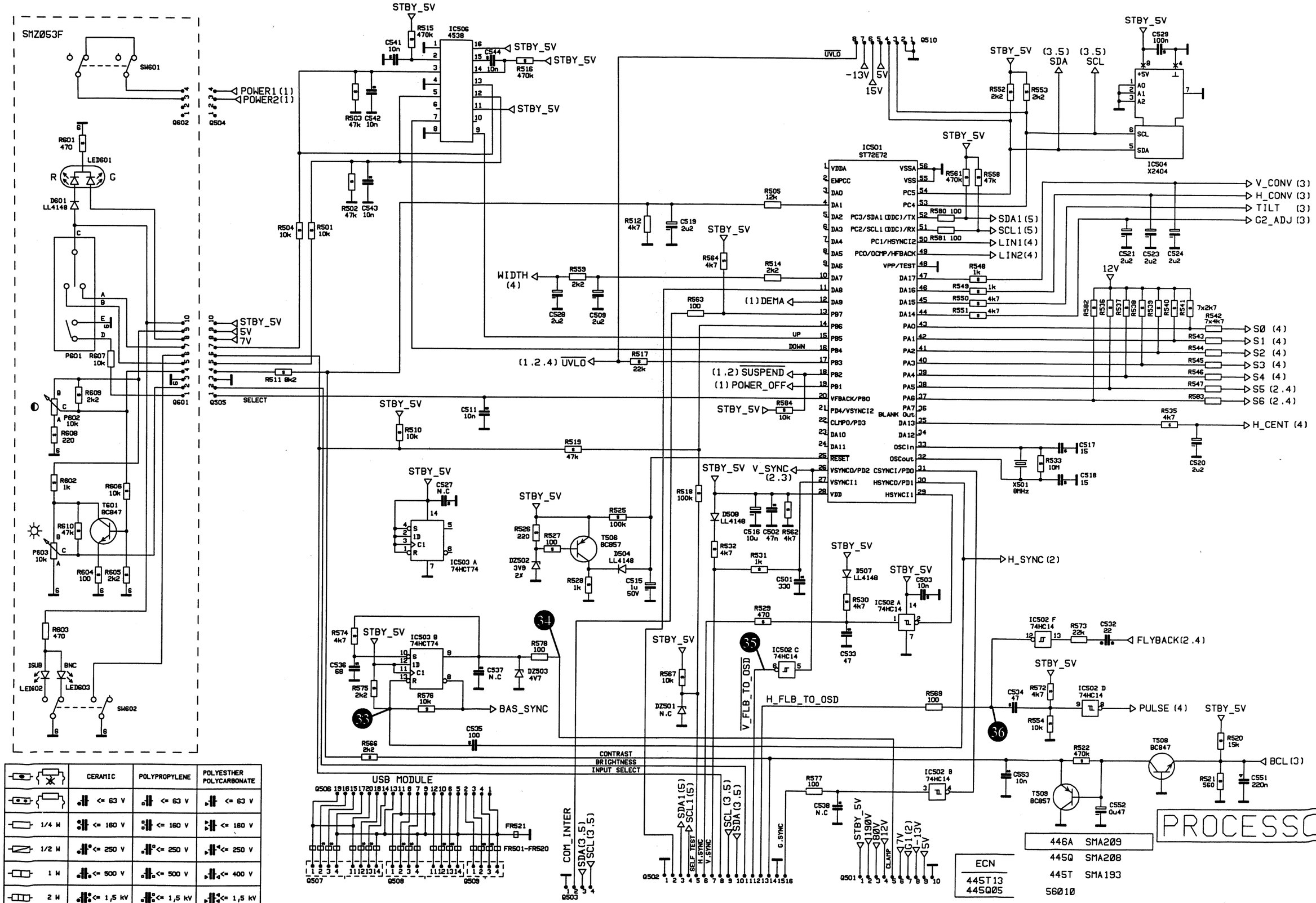

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

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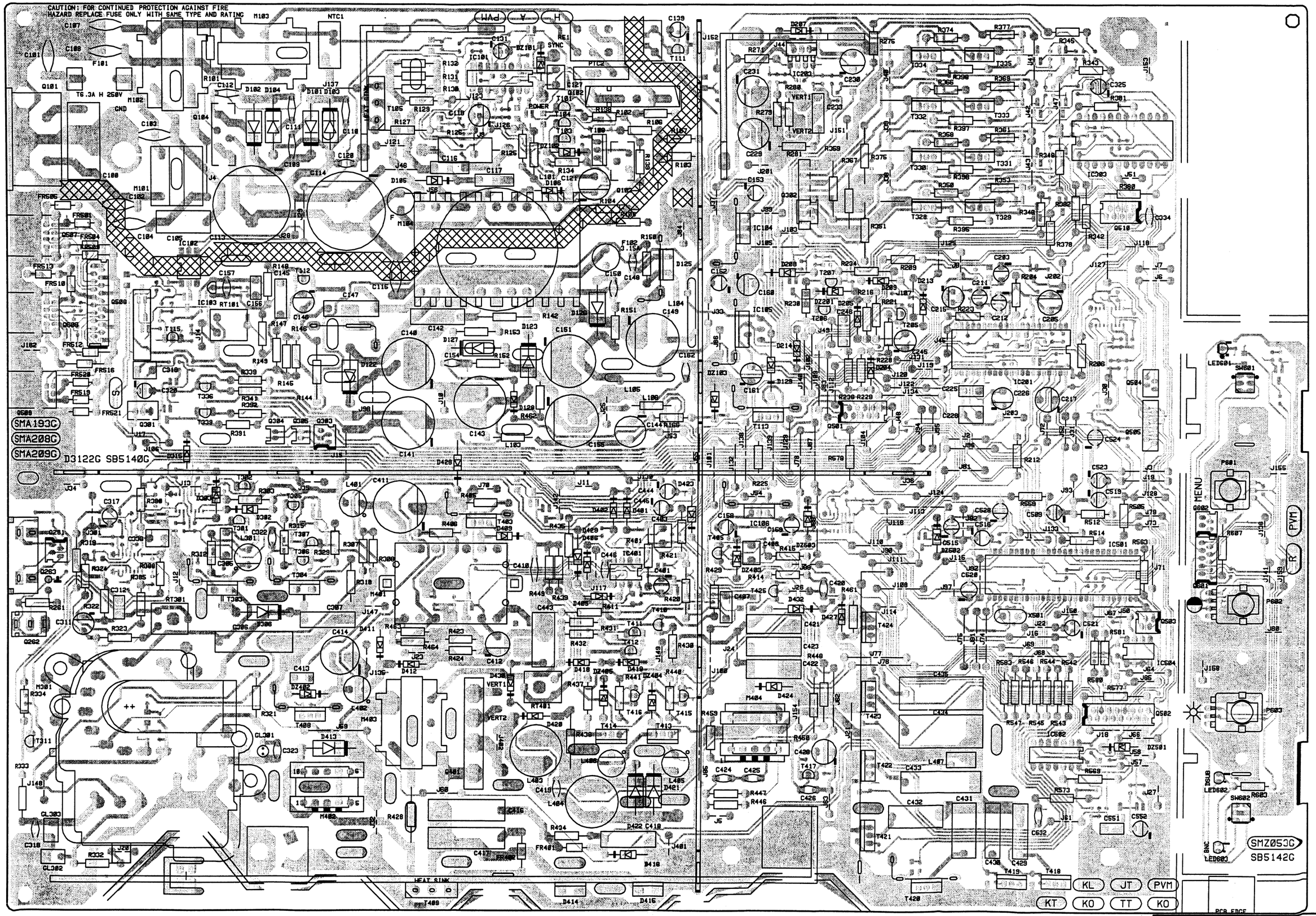

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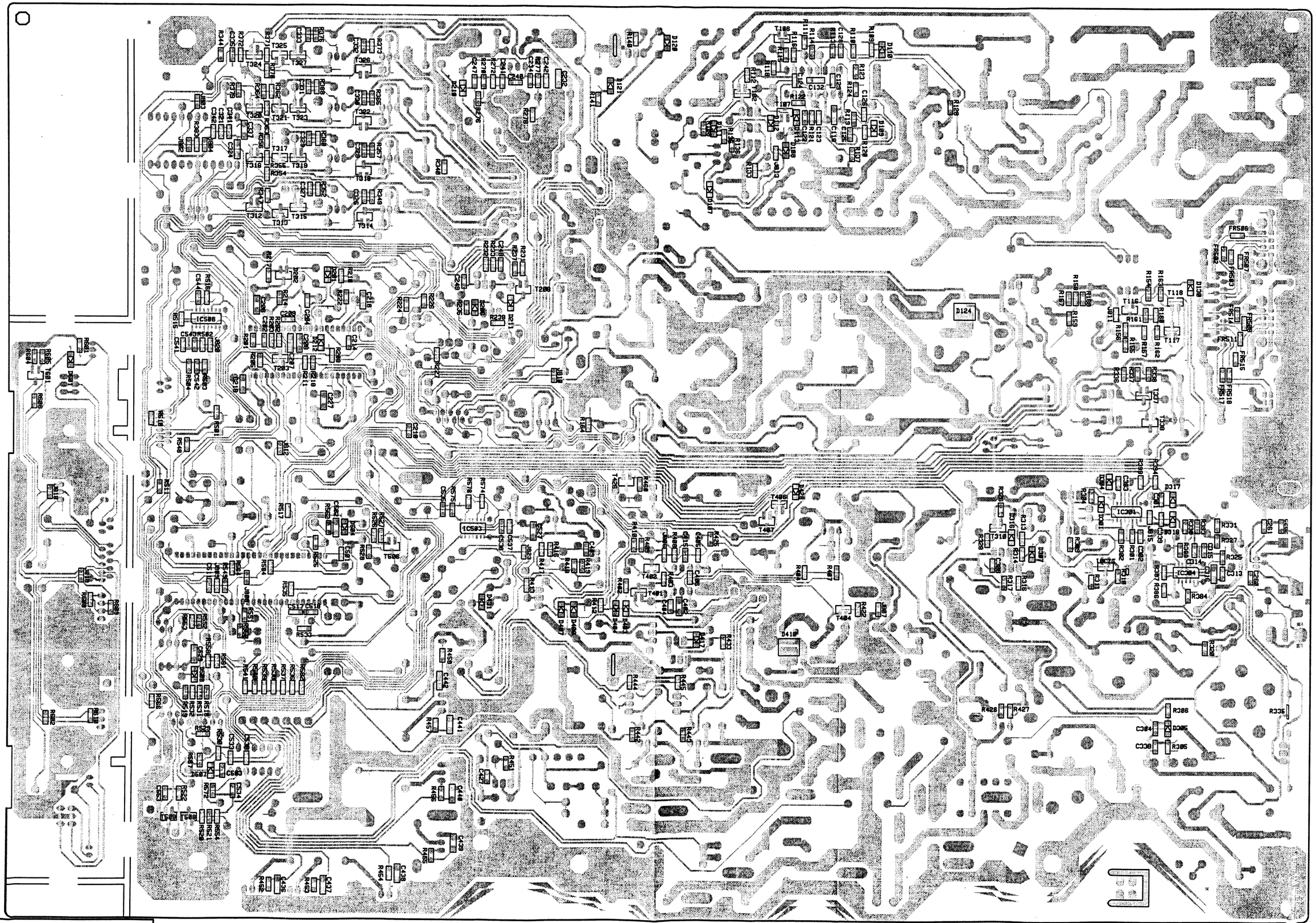
SMA209G

D3122G 10.97 Page 9



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Part Number	Description	PG	Item Number
AA0633	CF RES 0W25 22R J 2,5-7	1	RA 150 151 152 206
AA0641	CF RES 0W25 47R J 2,5-7	1	RA 236 374 377 358 361
AA0645	CF RES 0W25 68R J 2,5-7	1	RA 350 353
AA0649	CF RES 0W25 100R J 2,5-7	1	RA 563 569 577 580 581 578
AA0657	CF RES 0W25 220R J 2,5-7	1	RA 225 322 346 348
AA0665	CF RES 0W25 470R J 2,5-7	1	RA 147 431
AA0673	CF RES 0W25 1K0 J 2,5-7	1	RA 148 329 129 209 223 398 420 429 395 396
AA0673	CF RES 0W25 1K0 J 2,5-7	1	RA 501 504
AA0681	CF RES 0W25 2K2 J 2,5-7	1	RA 514 559 339 391
AA0685	CF RES 0W25 3K3 J 2,5-7	1	RA 411
AA0687	CF RES 0W25 3K9 J 2,5-7	1	RA 430
AA0689	CF RES 0W25 4K7 J 2,5-7	1	RA 378 542 543 544 545 546 547 583 303 382
AA0689	CF RES 0W25 4K7 J 2,5-7	1	RA 212 234 535 435 550
AA0697	CF RES 0W25 10K J 2,5-7	1	RA 216 401 421 450 584
AA0699	CF RES 0W25 12K J 2,5-7	1	RA 505
AA0705	CF RES 0W25 22K J 2,5-7	1	RA 512 573 517 230
AA0717	CF RES 0W25 68K J 2,5-7	1	RA 138 139
AA0721	CF RES 0W25 100K J 2,5-7	1	RA 459
AA0723	CF RES 0W25 120K J 2,5-7	1	RA 449
AA0725	CF RES 0W25 150K J 2,5-7	1	RA 324 448
AA0729	CF RES 0W25 220K J 2,5-7	1	RA 228
AA0731	CF RES 0W25 270K J 2,5-7	1	RA 414
AA0737	CF RES 0W25 470K J 2,5-7	1	RA 439 221 104 105 106 107
AA0745	CF RES 0W25 1M0 J 2,5-7	1	RA 440 441
AA0754	CF RES 0W25 2M2 J 2,5-7	1	RA 385 388
AA0755	CF RES 0W25 2M7 J 2,5-7	1	RA 390
AA0761	CF RES 0W25 4M7 J 2,5-7	1	RA 102 103 334 229
AB0585	NF RES 0W25 0R22 J 2,5-7 CF	1	RA 463 464
AB0609	NF RES 0W25 2R2 J 2,5-7 CF	1	RA 281
AB0625	NF RES 0W25 10R J 2,5-7 CF	1	RA 127
AB0649	NF RES 0W25 100R J 2,5-7 CF	1	RA 125
AB0795	NF RES 0W5 0R56 J 4-11 CF	2	RA 130 131 132 153 405 406
AC3366	CHIPRES 5K90 0W1 1% 0805	1	RA 272 277
AC3388	CHIPRES 10K0 0W1 1% 0805	1	RA 270
AC4409	CHIPRES 0W1 2R2 5% 0805 2013	1	RA 202
AC4425	CHIPRES 0W1 10R 5% 0805 2013	1	RA 407 427 442 443 222
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	1	JA 808
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	1	FRA 502 503 506 507 508 511 514 515 517 518
AC4433	CHIPRES 0W1 22R 5% 0805 2013	1	RA 309 310 316
AC4449	CHIPRES 0W1 100R 5% 0805 2013	1	RA 164 305 422 452 453 454 455 456 457
AC4449	CHIPRES 0W1 100R 5% 0805 2013	1	RA 458 527
AC4455	CHIPRES 0W1 180R 5% 0805 2013	1	RA 347 355 371
AC4457	CHIPRES 0W1 220R 5% 0805 2013	1	RA 155 317 354 356 370 372 526
AC4465	CHIPRES 0W1 470R 5% 0805 2013	1	RA 154 349 156 232 373 376 529 352 365 368
AC4465	CHIPRES 0W1 470R 5% 0805 2013	1	RA 357 360 433
AC4467	CHIPRES 0W1 560R 5% 0805 2013	1	RA 521
AC4469	CHIPRES 0W1 680R 5% 0805 2013	1	RA 451
AC4471	CHIPRES 0W1 820R 5% 0805 2013	1	RA 337
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	1	RA 109 141 238 161 210 326 336 404 338 548
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	1	RA 528 531 549 118 425
AC4479	CHIPRES 0W1 1K8 5% 0805 2013	1	RA 217
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	1	RA 128 158 167 121 306 314 327 426 552
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	1	RA 553 566 575
AC4483	CHIPRES 0W1 2K7 5% 0805 2013	1	RA 536 537 538 539 540 541 582
AC4489	CHIPRES 0W1 4K7 5% 0805 2013	1	RA 133 237 304 313 444 445 218 120
AC4489	CHIPRES 0W1 4K7 5% 0805 2013	1	RA 530 532 551 562 574
AC4491	CHIPRES 0W1 5K6 5% 0805 2013	1	RA 511
AC4493	CHIPRES 0W1 6K8 5% 0805 2013	1	RA 201
AC4497	CHIPRES 0W1 10K 5% 0805 2013	1	RA 112 113 157 160 162 163 226
AC4497	CHIPRES 0W1 10K 5% 0805 2013	1	RA 224 510 301 302 311 328
AC4497	CHIPRES 0W1 10K 5% 0805 2013	1	RA 330 331 384 403 460 567 576
AC4497	CHIPRES 0W1 10K 5% 0805 2013	1	RA 502 503 205 408 554 211
AC4501	CHIPRES 0W1 15K 5% 0805 2013	1	RA 122
AC4505	CHIPRES 0W1 22K 5% 0805 2013	1	RA 110 111 116 115 231 393 399
AC4505	CHIPRES 0W1 22K 5% 0805 2013	1	RA 402 410 520 233 409 235
AC4509	CHIPRES 0W1 33K 5% 0805 2013	1	RA 168 159
AC4511	CHIPRES 0W1 39K 5% 0805 2013	1	RA 119
AC4513	CHIPRES 0W1 47K 5% 0805 2013	1	RA 203 208 558 386 387 519
AC4519	CHIPRES 0W1 82K 5% 0805 2013	1	RA 335
AC4521	CHIPRES 0W1 100K 5% 0805 2013	1	RA 135 412 413 518 525
AC4523	CHIPRES 0W1 120K 5% 0805 2013	1	RA 108
AC4529	CHIPRES 0W1 220K 5% 0805 2013	1	RA 136
AC4537	CHIPRES 0W1 470K 5% 0805 2013	1	RA 227 522 394 561
AC4547	CHIPRES 0W1 1M2 5% 0805 2013	1	RA 123 124
AC4549	CHIPRES 0W1 1M5 5% 0805 2013	1	RA 137
AC4553	CHIPRES 0W1 2M2 5% 0805 2013	1	RA 389
AC4561	CHIPRES 0W1 4M7 5% 0805 2013	1	RA 140 214
AC4569	CHIPRES 0W1 10M 5% 0805 2013	1	RA 533
AC8661	CHIPRES 0W12 330R J 1206 3216	1	RA 300
AD0349	COMPRES 0W5 100R K 4-11	1	RA 321
AD0373	COMPRES 0W5 1K0 K 4-11	1	RA 332
AD0397	COMPRES 0W5 10K K 4-11	1	RA 333
AD0445	COMPRES 0W5 1M0 K 4-11	1	RA 101
AG3101	MF RES 0W5 1R00 F TC200 2,5-7	1	RA 145 146 279 432
AB0785	NF RES 0W5 0R22 J 4-11 CF	2	RA 318
AG3119	MF RES 0W5 1R54 F TC200 2,5-7	1	RA 424
AG3133	MF RES 0W5 2R15 F TC200 2,5-7	1	RA 423 462
AG3165	MF RES 0W5 4R64 F TC200 2,5-7	1	RA 434
AG3233	MF RES 0W5 21R5 F TC50 2,5-7	1	RA 437
AG3273	MF RES 0W5 56R2 F TC50 2,5-7	1	RA 315
AG3301	MF RES 0W5 100R F TC50 2,5-7	1	RA 341 392

Part Number	Description	PG	Item Number
AG3343	MF RES 0W5 274R F TC50 2,5-7	1	RA 280
AG3465	MF RES 0W5 4K64 F TC50 2,5-7	1	RA 134 446 447
AG3477	MF RES 0W5 6K19 F TC50 2,5-7	1	RA 204
AG3489	MF RES 0W5 8K25 F TC50 2,5-7	1	RA 307 465
AG3501	MF RES 0W5 10K0 F TC50 2,5-7	1	RA 271 165
AG3519	MF RES 0W5 15K4 F TC50 2,5-7	1	RA 461
AG3543	MF RES 0W5 27K4 F TC50 2,5-7	1	RA 308
AG3609	MF RES 0W5 121K F TC50 2,5-7	1	RA 323
AG3619	MF RES 0W5 154K F TC50 2,5-7	1	RA 149
AJ2523	MO RES 2W0 10R J 6-17	2	RA 428
AJ2763	MO RES 2W0 100R J 6-17	2	RA 351 359 375 436
AJ2863	MO RES 2W0 270R J 6-17	2	RA 142 144
AJ3425	MO RES 4W0 56K J 9-22	2	RA 126
AQ2214	TPMET.AA H10 1K0 RM 5X10 6-HOLE	3	RTA 401
AQ2347	TPMET. H10 10K RM 5X10 6-HOLE	4	RTA 101 402
AQ2219	TPMET.AA H10 47K RM 5X10 6-HOLE	3	RTA 301
AW0079	PTC-THERMISTOR 18R/25'C RM5	7	PTCA 002
AW0111	NTC-THERMISTOR 5R0/25'C RM5+2,5	7	NTCA 001
CA0324	CERCAP Y5P 100P K 1KV Y5 D8 L	2	CA 148 150 154 323 425 446
CB0418	CERCAP N150 22P J 500V Y5: D8	1	CA 532
CC0130	CERCAP Y5P 220P K 500V Y5: D8	1	CA 424
CC0170	CERCAP Y5P 470P K 500V Y5: D8	1	CA 419 447
CC0200	CERCAP Y5P 1N0 K 500V Y5: D9	1	CA 448
CC0240	CERCAP Y5P 2N2 K 500V Y5: D9	1	CA 120 157 318 322 426
CC0513	CERCAP Y5V 3N3 S 1KV Y7,5 D14	2	CA 109 110 111 112 410
CC0530	CERCAP Z5U 4N7 S 500V Y5: D9	1	CA 162
CE0081	X2-CAP 220N K 250VAC Y20 121725	8	CA 100
CE0116	Y-CAP 2N2 M 400VAC Y12,5 SDPJ16	4	CA 101 102 106 107 108 115
CB3137	CHIPCERCAP NP0 33P 50V J 0805	1	CA 517 518
CB3141	CHIPCERCAP NP0 47P 50V J 0805	1	CA 248 339 533
CB3145	CHIPCERCAP NP0 68P 50V J 0805	1	CA 302 536
CB3151	CHIPCERCAP NP0 100P 50V J 0805	1	CA 124 301 303 313 535
CB3159	CHIPCERCAP NP0 220P 50V J 0805	1	CA 123 427
CB3163	CHIPCERCAP NP0 330P 50V J 0805	1	CA 314 501
CB3167	CHIPCERCAP NP0 470P 50V J 0805	2	CA 122 406
CB3171	CHIPCERCAP NP0 680P 50V J 0805	1	CA 209
CB3175	CHIPCERCAP NP0 1N0 50V J 0805	3	CA 242 308 210 125
CC0530	CERCAP Z5U 4N7 S 500V Y5: D9	1	CA 420
CC3240	CHIPCERCAP X7R 2N2 10% 50V 0805	1	CA 405
CC3260	CHIPCERCAP X7R 3N3 10% 50V 0805	1	CA 249
CC3280	CHIPCERCAP X7R 4N7 10% 50V 0805	1	CA 234 338 415 128
CC3320	CHIPCERCAP X7R 10N 10% 50V 0805	1	CA 126 129 335 204 214
CC3320	CHIPCERCAP X7R 10N 10% 50V 0805	1	CA 241 304 503 404 511 542 553 543
CC3320	CHIPCERCAP X7R 10N 10% 50V 0805	1	
CC3360	CHIPCERCAP X7R 22N 10% 50V 0805	1	CA 202
CC4400	CHIPCAP X7R 47N K 50V 1206	2	CA 207 208 502
CC4855	CHIPCAP Y5V 100N Z 50V 1206	3	CA 119 132 216 227 232 316 402 436
CC4855	CHIPCAP Y5V 100N Z 50V 1206	3	CA 437 438 439 440 441 442 529 206 218
CE2435	IMPCAP 15N J 400V Y10 061113	3	CA 429
CE2671	IMPCAP 33N J 400V Y15 061118	4	CA 430 443
CE2802	IMPCAP 51N J 400V Y15 081418	3	CA 421 422 423
CE2852	IMPCAP 68N J 400V Y15 081418	4	CA 431
CE2931	IMPCAP 100N J 250V Y15 081418	4	CA 306
CE2964	IMPCAP 150N K 250V Y15 091518	5	CA 432
CE3063	IMPCAP 330N J 250V Y22,5 111928	5	CA 433
CE3163	IMPCAP 680N J 250V Y22,5 112128	7	CA 434
CE3223	"IMPCAP 1U2 J 250V""G""Y22,5 091928"	7	CA 435
CE0522	PCACAP MKC 100N J 63V Y5: 040808	4	CA 413
CE2004	IMPCAP 100P K 1K6V Y15 051118	3	CA 142 147
CE2094	IMPCAP 820P K 1K5V Y15 061218	4	CA 307
CE2196	IMPCAP 2N2 J 2KV Y22,5 081628	6	CA 416 417
CE2671	IMPCAP 33N J 400V Y15 061118	4	CA 418
CG2663	PPRCAP KP 4N7 H 63V Y5: 060808	4	CA 127
CK0165	PESCAP MKT 22N K 630V Y10 061213	2	CA 116 117
CK0341	PESCAP MKT 220N K 100V Y10 051113	3	CA 233
CK1388	PESCAP MKT 10N K 250V Y7,5 040911	2	CA 305 407
CK1546	PESCAP MKT 47N K 100V Y7,5 040911	2	CA 246
CK2545	PESCAP 47N K 63V Y5: 030708	2	CA 312
CK2626	PESCAP MKT 100N K 63V Y5: 030808	2	CA 156 336
CK2663	PESCAP MKT 150N J 63V Y5: 040908	3	CA 225
CK2704	PESCAP MKT 220N K 63V Y5: 040908	3	CA 551 319
CK2784	PESCAP MKT 470N K 63V Y5: 051008	3	CA 228
CK2864	PESCAP MKT 1U0 K 50V Y5:061108!	5	CA 403
CN0118	ELCAP 150U M 400V R10 SNAP 25X40	16	CA 113 114
CN0204	ELCAP 2U2 M 50V RM5 : 6*12	1	CA 320 444 445 509
CN0204	ELCAP 2U2 M 50V RM5 : 6*12	1	CA 519 520 521 523 524 528
CN0819	ELCAP'2200U M 25V RM7,5 105'17X38	5	CA 149 151 155
CN2017	ELCAP 1U0 M 50V RM5: 105' 6X12	2	CA 139 317 515 131 212
CN2027	ELCAP 47U M 50V RM5: 105' 9X12	2	CA 205 226
CN2029	ELCAP 4U7 M 100V RM5: 105' 6X12	3	CA 245
CN2032	ELCAP 10U M 50V RM5: 105' 6X12	1	CA 152 153 158 159 516 401 311
CN2037	ELCAP 10U M 160V RM5 105' 11X21	4	CA 144
CN2461	ELCAP- 47U M 100V RM5 105, 10X16	4	CA 121
CN2543	ELCAP 100U M 50V RM5 105 11X13	2	CA 146 160 161 215 230 428 412 217
CN2546	ELCAP 100UF M 100V RM5 105' 14X21	5	CA 143
CN2553	ELCAP 0U47F M 50V RM5: 105' 6X12	1	CA 211 552
CN2566	ELCAP 4U7F M 50V RM5: 105'6X12MM	2	CA 203
CN2581	ELCAP 220U M 35V RM5 105 11X13	3	CA 229 231
CN3206	ELCAP 10U M 50V RM5 105' 8X14	3	CA 118
CN3250	ELCAP, 47U M 250V RM7,5 105'16X25	5	CA 140 141
CN3312	ELCAP 100U M 250V RM7.5 105'18X36	9	CA 411

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Part Number	Description	PG	Item Number
CN3402	ELCAP,1000U M 16V RM5 +105'13X34	12	CA 414
FJ0274	CHOKE 1,0UH	2	LA 407
FJ0448	CHOKE 13UH FERRITE 2X15	2	LA 104 105
FJ0505	CHOKE 15UH 5% TAPED AXIAL	2	LA 103 106
FJ0517	CHOKE 6.8UH 10% TAPED AXIAL	3	LA 101
FJ0724	CHOKE 470UH 10% 5 MM RADIAL	8	LA 405
FJ0725	BEAD INDUCTOR MIN IMP360HM	2	FRA 401 402
FJ0725	BEAD INDUCTOR MIN IMP360HM	2	FRA 501 504 505 509 510 512 513 516
FJ0725	BEAD INDUCTOR MIN IMP360HM	2	FRA 519 520 521
J0730	LEAD INDUCTOR 270UH 10%	5	LA 406
FJ0733	LEAD INDUCTOR 56UH 10 %	7	LA 401 402
FJ0800	EMI/RFI CHOKE 60MH 3A(AC)	14	MA 101
FM0636	FLYBACK TRAFO 30..120KHZ 445T	38	MA 301
FJ1826	INPUT CHOKE E30/7 2X6,9 MH	12	MA 102 103
FM2560	DYNAMIC FOCUS TRAFO E20/6 445R	12	MA 404
FM2570	DRIVER TRAFO E20/6 N67 17.2U 445T	12	MA 402
FM2571	INPUT TRAFO ETD34 N87 382UH 445T	20	MA 401
FM2577	CENTERING COIL E30/7 446A	12	MA 403
FM3505	SMPS-TRAFO ETD49 N67 445T	19	MA 104
FU0725	FIXED LINEARITY COIL N-S 446A	19	LA 403
FU0726	FIXED LINEARITY COIL S-N 446A	5	LA 404
FY6530	FERRITE CORE 17.5X9.5X28.5 L8	1	
JF0025	DI 1N4148 75V 200MA 4N	1	DA 204 208 209 401 402 406 302 303 429 213
JF0025	DI 1N4148 75V 200MA 4N	1	DA 214
JF0060	DI 1N4002 100V 1A	1	DA 207
JF0067	DI 1N4007 1000V 1A	1	DA 129
JF0206	SCHOTTKY RECTIFIER 30V 1A 1N5818	4	DA 405
JF0072	DI BAV21 200V 250MA 50N	1	DA 128 205 315 432
JF0096	DI BYV28-100 100V 3.5A 30N	7	DA 126 413 421 422
JF0166	DIODE BYM26C 600V 2.3A SOD-64	6	DA 122 123
JF0171	DI BYV29-400 400V 8A 50NS TO-220	9	DA 125
JF0032	DI UF4007 1000V 1A 75N DO41/SOD57	4	DA 105 409
JF0033	DI UF5404 400V 3A 50NS	4	DA 127
JF0034	DI UF5406 600V 3A 75N	9	DA 306
JF0073	DI RGP10G 400V 1A 150N	4	DA 418 419 420 427 416 423 424
JF0104	DI BYV27-200 200V 2A 25N SOD57	3	DA 411 412 106 430
JF0107	DI BYV26C 600V 1A 30N	5	DA 426
JF4003	DI BAV103 200V 250MA 50NS SOD-80	7	DA 407 408 431 108
JF4005	DI LL4148 75V 150MA 4N (JF4006)	1	DA 107 109 110 120 121 201 206 210 211 301
JF4005	DI LL4148 75V 150MA 4N (JF4006)	1	DA 304 305 307 316 317 318 403 404 212
JF4005	DI LL4148 75V 150MA 4N (JF4006)	1	DA 504 507 508 417 428 111 130 112 113
JF4011	SCHOTTKY BARRIER 30V 200MA SOT-23	3	DA 202
JF4101	DI RHRD460S 600V 4A 30NS TO-252	8	DA 124 410
JB0044	DI DTV110F 1500V 10A TO220FI	14	DA 414
JB0047	DI GP30M 1000V 3A 3,0US DO201AD	4	DA 101 102 103 104
JH0053	ZDI BZX83C5V6 5.6V 0.5W 5%	1	DZA 101
JH0054	ZDI BZX83C12 12V 0.5W 5%	1	DZA 402 404 405 103
JH0059	ZDI BZX83C8V2 8.2V 0.5W 5%	1	DZA 102
JH0086	ZDI BZX83C4V7 4.7V 0.5W 5%	2	DZA 503
JH0169	ZDI BZX55B3V9 3,9V 0,5W 2%	3	DZA 502
JH0085	ZDI BZX83C22 22V 0.5W 5%	1	DZA 201
JH4118	ZDI BZX84C12 0.225W 5% SOT-23	2	DZA 301
JM0099	TR BC547B N 45V 100A 200M:	1	TA 301 305 307
JM0100	TR BC557B P 45V 100A 200M:	1	TA 115 302 306
JM0202	TR MPSA44 N 400V 300MA TO92	3	TA 101
JM0203	TR MPSA42 N 300V 500MA TO92	3	TA 415 416
JM0205	TR BF423 P 250V 25MA 60M:	3	TA 112
JM0206	TR BF420 N 300V 100MA 60M TO-92:	12	TA 410 417
JM0227	TR MPS2369 N 15V 200MA 500M	3	TA 207
JM0239	TR BC638 P 60V 1A 50M:	4	TA 103 336
JM0244	TR BF422 N 250V 25MA 60M:	2	TA 311 425
JM0252	TR BC639-10 N 100V 1.5A TO92	3	TA 412
JM0273	TR 2N5551 NPN 160V 0,6A	2	TA 104 205 206
JM0280	TR 2N5401 P 150V 0.6A 100M	2	TA 411
JM0285	TR BC637-16 N 40V 1A 60M:	4	TA 339
JM0334	TR BD135 NPN 45V 1A5 250MHZ TO126	4	TA 328 330 334
JM0335	TR BD136 PNP 45V 1A5 250MHZ TO126	4	TA 329 331 335
JM4105	TR BC847B N 45V 0.1A SOT23	2	TA 117 118 203 102 324 337 312 315 316 319
JM4105	TR BC847B N 45V 0.1A SOT23	2	TA 327 404 406 208 508
JM4114	TR BC857B P 45V 100MA 150M:	2	TA 106 107 116 509 426 310 313 314 317
JM4114	TR BC857B P 45V 100MA 150M:	2	TA 318 338 325 326 401 402 407 506
JM4401	TR BCR141W 50V 0.1A (2X22K)SOT323	2	TA 511 512 513 514 515 516 517
JM0341	TR BUH1215(435B) N 1500V 19ATO218	19	TA 409
JS1006	FET BS170 N 60V 500MA	10	TA 111
JS0019	FET IRF640 N 200V 18A TO220	13	TA 421 422 423 424
JS0019	FET IRF640 N 200V 18A TO220	13	TA 418 419
JS0019	FET IRF640 N 200V 18A TO220	13	TA 420
JS0026	FET IRFBC40 N 600V 6.0A TO220 AB	10	TA 403
JS0030	FET IRF620 200V 5A 0.8R TO-220	7	TA 413 414
JS0035	FET IRF820 N 500V 2.5A 3.0R	10	TA 113
JS0049	FET 2SJ306 P 250V 3A 1.5R TO220	19	TA 303
JS0051	FET IRF9540 P 100V 19A 0.2R TO220	14	TA 408
JS0062	FET IRFPC50 N 600V 11A OR60 TO247	17	TA 105
JS0063	FET IRFIBE30G N 800V 2,1A 3R0 220	23	TA 304
LM4406	IC LM324 QUAD OP-AMP SO-14	5	ICA 304
LM0893	IC 74HC14N 6XINV.SCHMITT-TRIGGER	5	ICA 502
LM0967	IC SI-3120FA 12V LOWDROP REG 2%	9	ICA 105
LM4111	IC 4538BT	5	ICA 301
LM0067	IC UA7805UC +5V REGULATOR TO-220	13	ICA 104 106
LM4022	IC 74HCT74 DUAL D-FLIP-FLOP SO-14	5	ICA 503
LM0930	IC STV9379 VERT.DEFL.BOOSTER	15	ICA 203

Part Number	Description	PG	Item Number
LM0663	IC TL431 VOLTAGE REFERENCE TO-92	6	ICA 103
LM0969	IC ST72E75 MONITOR UC DIP56	30	ICA 501
LM0957	IC UC3843 CURR.MODE PWM CON.DIP-8	6	ICA 401
LM0981	IC M24128 EEPROM 128K (16X8) DIL8	19	ICA 504
LM0959	IC L4990 PRIMARY CONTROLLER DIP16	10	ICA 101
LM0962	IC TDA9106A DEFLECTION PROCESSOR	19	ICA 201
LZ0003	IC-SOCKET 8-POLE DIL SINGLE LEAF	3	ICA 504
LZ0063	IC-SOCKET 56-POLE DUAL LEAF 1.78	10	ICA 501
JL0062	OPTOCOUPLER CNY17F-2 5,3KV	8	ICA 102
QH0068	RELAY PCB-MOUNT 12V 5A/250V DPDT	13	REA 001
SE2530	POWER SYNC. WIRE 447C	8	MA 301
QK1446	WIRE TERMINAL FOR 1,85MM HOLES	1	002
XS0440	WIRE 2-ISOL 0,32MM2 UL1011 BROWN	5	001
SE2643	VERT. WIRE 445R	6	VA 001 002
SE2732	CONNECTING WIRE 446A	11	QA 306
FY0267	FERRITE RING 19*12.7*6.4MM	4	005
QK0530	WIRE CONN BODY 1X02 2,5 CRIMP	2	003
QK0823	CRIMP CONTACT FOR MKH-SERIE	1	004
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	1	JA 802 803 804 805 806 809 810
AC4400	CHIPRES 0W1 0R0 5% 0805 2013	1	JA 811 813 815 818 819 823
QA0098	CRYSTAL 24.000MHZ FUNDAM. HC-49/U	6	XA 501
QT0002	SPARK GAP 1,2KV +-500V R=5,0MM	3	GLA 302 303
QT0207	GLIMM LAMP 95V 6*12,5MM	4	GLA 301
QT0102	FUSEHOLDER CLIPS 5*20MM R=5,0MM	1	FA 101
QT0775	FUSE 5*20MM T 6,3A 250V 1500A	3	FA 101
QT0733	FUSE R=5,0MM T 3,15A 250V IEC127	4	FA 102
AA0665	CF RES 0W25 470R J 2,5-7	1	RZ 603
AA0697	CF RES 0W25 10K J 2,5-7	1	RZ 607
AC4449	CHIPRES 0W1 100R 5% 0805 2013	1	RZ 608
AC4457	CHIPRES 0W1 220R 5% 0805 2013	1	RZ 604
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	1	RZ 602
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	1	RZ 605 609
AC4465	CHIPRES 0W1 470R 5% 0805 2013	1	RZ 601
AC4499	CHIPRES 0W1 12K 5% 0805 2013	1	RZ 606
AC4513	CHIPRES 0W1 47K 5% 0805 2013	1	RZ 610
AP0191	PMET 10K LIN EVJ02KFB6B14 CCLICK	10	PZ 602 603
JL0058	LED DUALCOLOR RED/GREEN 3 MM	4	LEDZ 601
JL0061	LED GREEN MPG3372X 3MM	3	LEDZ 602 603
JM4105	TR BC847B N 45V 0.1A SOT23	2	TZ 601
JF4005	DI LL4148 75V 150MA 4N (JF4006)	1	DZ 601
QG0329	MINIATURE PUSH SWITCH 0.1A 24VDC	10	SWZ 601 602
QG0401	ENCODER 20PULSE/ 360' WITH SWITCH	14	PZ 601
QK0851	TAP CONN RTM 1,3/5/8.002	1	QA 402
QK1415	CRIPLET CONN FOR 2-SIDED PCB	1	
QK1285	ROW CONN 1X05 5,08/7,62 VERT/LOCK	3	QA 102
QK1287	PIN STRIP 1X04 8,0/10.0 VERT MALE	3	QA 401
QK1587	COOLING & SUPP.PART FOR RESISTOR	1	RA 126
QK1650	MAINS CONN MALE 90DEG W/PCB SNAPS	8	QA 101
QK1701	PICOFLEX HEADER 1X04 1,27MM	3	QA 504
QK1704	PICOFLEX HEADER 1X10 1,27MM	4	QA 505
QK1730	SHROUDED HEADER 2POS 2,5 JST VER	3	QA 304 305
QK1731	SHROUDED HEADER 3POS 2,5 JST VER	2	QA 301
UC1140	COOLING PLATE PN45154 COPPER	2	TA 113 303 304 403 408 420
UC1140	COOLING PLATE PN45154 COPPER	2	TA
UC1140	COOLING PLATE PN45154 COPPER	2	ICA 104 105 106
UC1140	COOLING PLATE PN45154 COPPER	2	DA 125
UC6564	COOLING PLATE PN303153	5	TA 105
UC6564	COOLING PLATE PN303153	5	ICA 203
UC6647	COOLING PLATE 445X	9	TA 328 329 330 331 334 335
UC6664	COOLING PLATE	14	TA 421 422 423 424
UC6784	COOLING PLATE PN410058 447E	4	DA 124
UC6912	COOLING PLATE 445T	10	TA 409
UC6912	COOLING PLATE 445T	10	DA 414
UC0859	FASTENING SPRING PN44473	2	TA 113 303 304 403 408 420 421 422 423
UC0859	FASTENING SPRING PN44473	2	TA 424
UC0859	FASTENING SPRING PN44473	2	ICA 104 105 106
UC0859	FASTENING SPRING PN44473	2	DA 125
UC6551	FASTENING SPRING	3	DA 414
UC6551	FASTENING SPRING	3	ICA 203
UC6552	FASTENING SPRING	3	TA 105 409
UC6668	FASTENING SPRING TO126	2	TA 328 329 330 331 334 335
UC6743	SUPPORT	6	
UC6752	WASHER 447E	1	MA 301
UC6752	WASHER 447E	1	
UC6893	SUPPORT 445P	5	
UJ0125	TIES SST 1 M	1	
UJ0251	TIES PN30181 447S	4	
JZ0005	SILICONE INSUL. PAD 19*13*0.22MM	1	ICA 203
JZ0018	SILIC/AL INSUL. WITH GLUE 19*13	3	TA 113 403 408 420 421 422 423 424
JZ0018	SILIC/AL INSUL. WITH GLUE 19*13	3	ICA 104 106
JZ0018	SILIC/AL INSUL. WITH GLUE 19*13	3	DA 125
JZ0012	SILICONE INSUL. 22*30*0.22MM	4	TA 105 409
JZ0017	SILICONE INSUL.10X13X0,22 TO-126	2	TA 328 329 330 331 334 335
QM1034	PICOFLEX ASSY BI-IDC 10-POS 120MM	8	QZ 601
QM1035	PICOFLEX ASSY BI-IDC 4-POS 120MM	7	QZ 602
QM1036	PICOFLEX ASSY BI-BI 4-POS 350MM	8	QA 302 303
QM1037	PICOFLEX ASSY BI-IDC 16-POS 650MM	12	QA 502
QM1040	PICOFLEX ASSY BI-IDC 10-POS 510MM	8	QA 501
WC0353	PT-SCR KB 40X10 WN1447 FE/ZN YELL	1	MA 301
WC0446	SCREW 2,9X8 FE/ZN	1	
WC0530	SCREW 2,9X10 YELLOW FE/ZN	2	MA 301

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NB. Safety components marked with ⚠ must be replaced with original or approved components only. All printed boards and the back cover are also safety components

POWER SUPPLY

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

445Q	SMA228
445U	SMA226 .SMA227
445T	SMA224 .SMA225
446A	SMA217 .SMA221

56015

ECN	ECN	ECN
445Q23	445T18	446A23

446A

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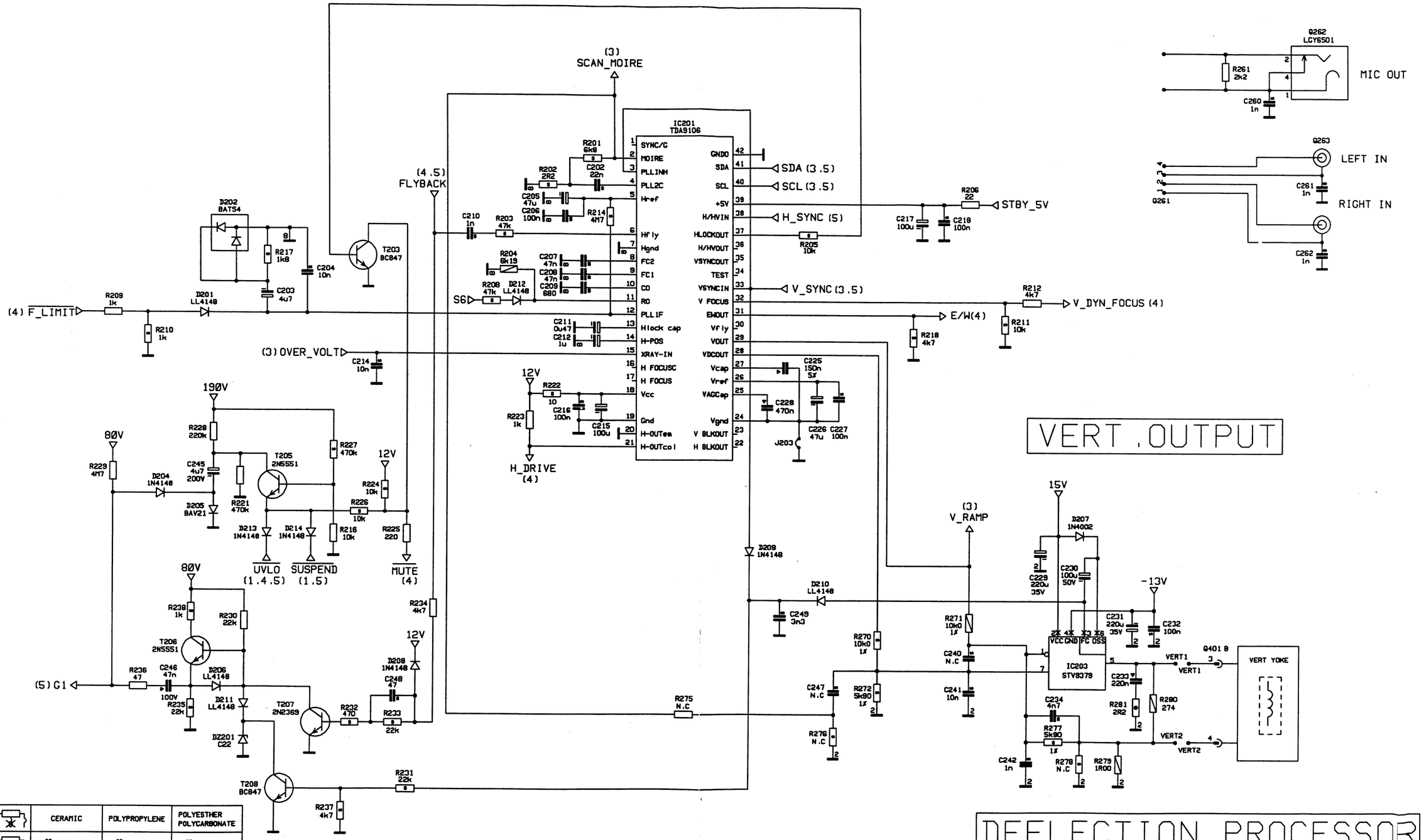

VERT. OUTPUT

DEFLECTION PROCESSOR

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

445Q	SMA228
445U	SMA226.SMA227
445T	SMA224.SMA225
446A	SMA217.SMA221

56015

ECN	ECN	ECN
445Q23	445T18	446A23

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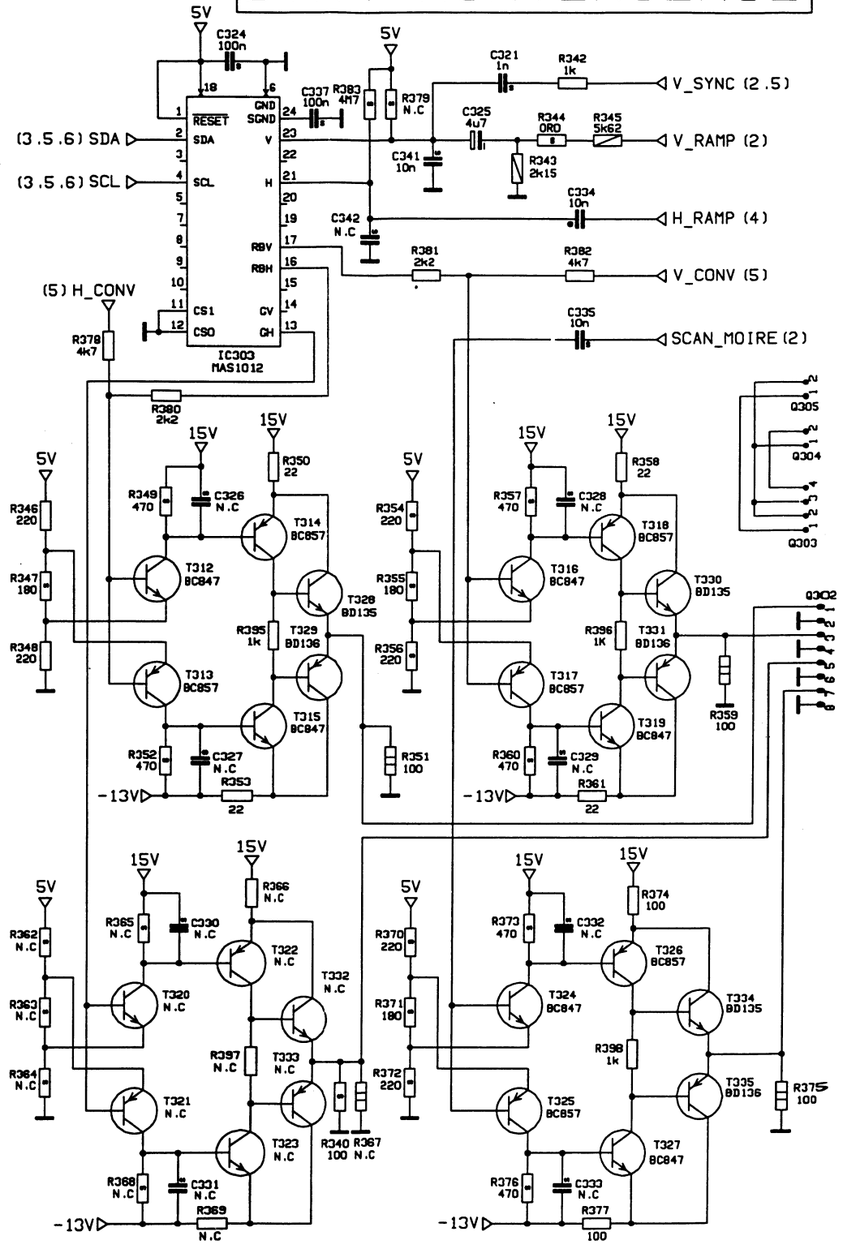
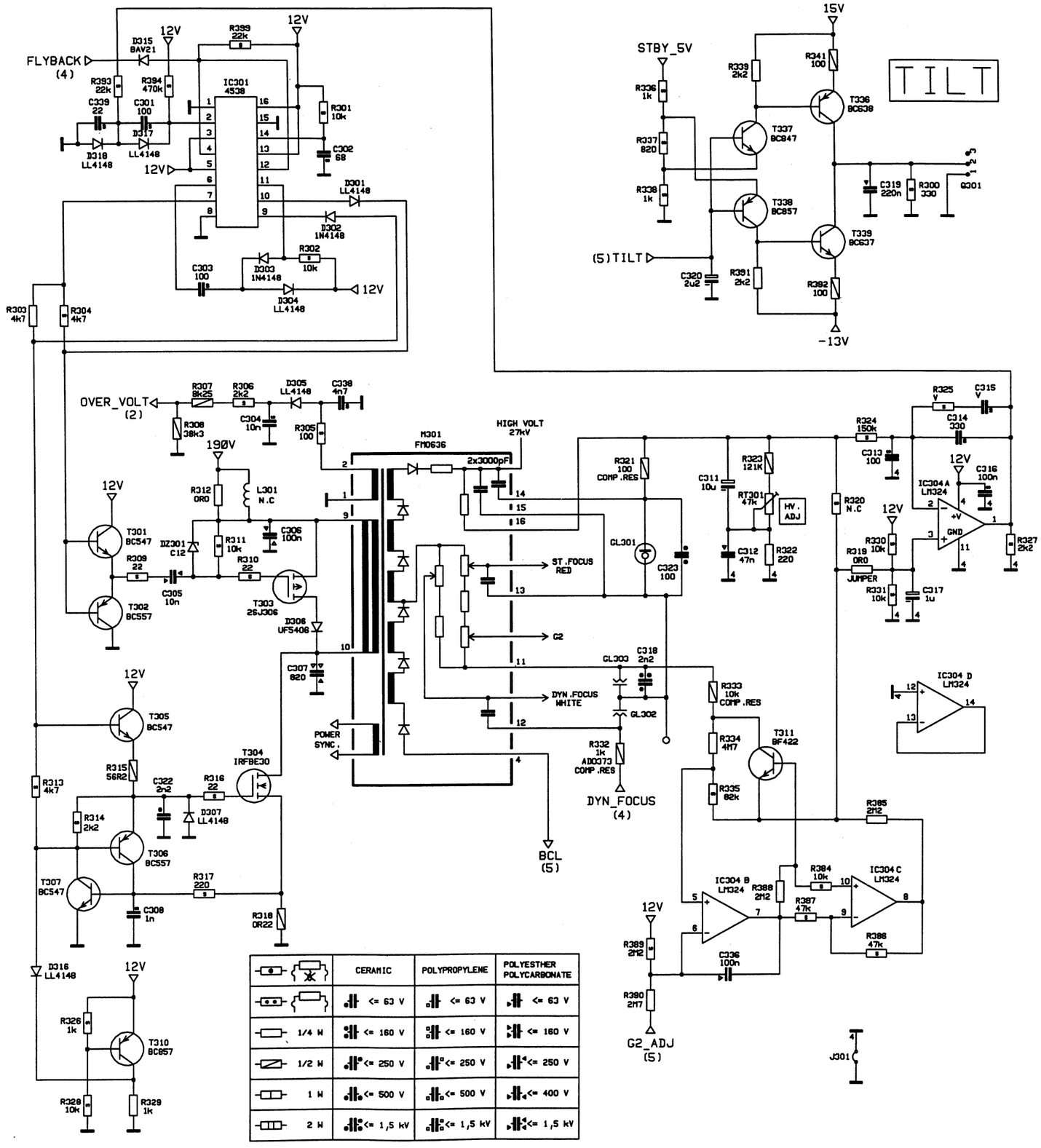
DYN. KONVERGENCE



TILT



	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

HV GENERATOR

445Q	SMA228
445U	SMA226 .SMA227
445T	SMA224 .SMA225
446A	SMA217 .SMA221

56015

ECN	ECN	ECN
445Q23	445T18	446A23

446A

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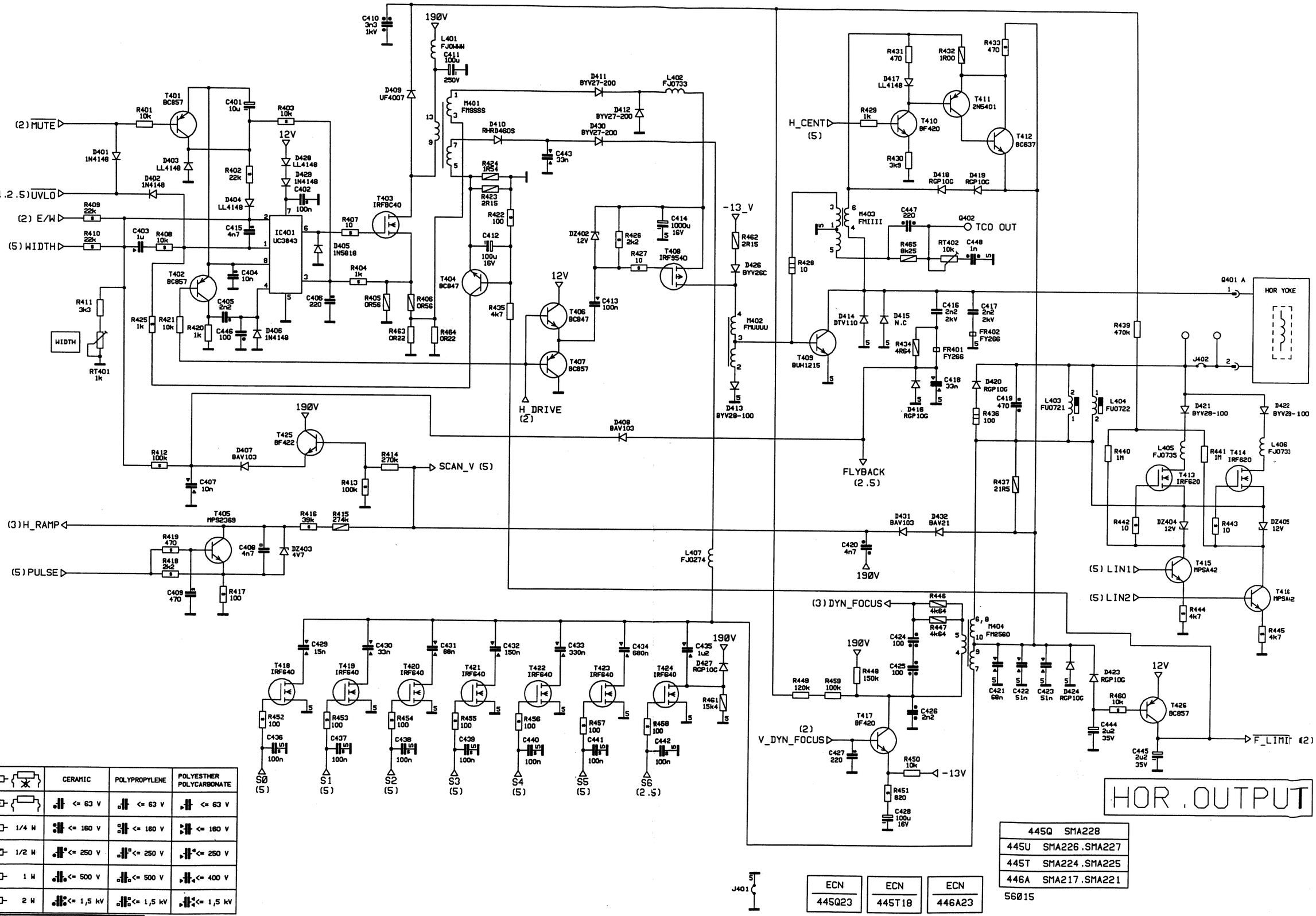

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

ECN	ECN	ECN
445Q23	445T18	446A23

445Q	SMA228
445U	SMA226.SMA227
445T	SMA224.SMA225
446A	SMA217.SMA221

56015

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SMZ070B
SMZ078B

SW601
Q602
Q504
POWER1(1)
POWER2(1)

R601 470
LED601
D601 LL4148
P601
R607 10k
Q601
R609 2k2
P602 10k
R608 220
R602 1k
R606 10k
T601 BC847
R610 47k
P603 10k
R604 100
R605 2k2
R603 470
ISUB
BNC
LED602
LED603
SW602

	CERAMIC	POLYPROPYLENE	POLYESTHER POLYCARBONATE
	<= 63 V	<= 63 V	<= 63 V
1/4 W	<= 160 V	<= 160 V	<= 160 V
1/2 W	<= 250 V	<= 250 V	<= 250 V
1 W	<= 500 V	<= 500 V	<= 400 V
2 W	<= 1,5 kV	<= 1,5 kV	<= 1,5 kV

STBY_5V
5V
7V
Q505
SELECT
R511 8k2

R502 10k C543 10n
R503 10k C542 10n
C511 10n
R510 10k
R519 47k

STBY_5V
C527 N.C
IC503 A 74HCT74

R574 4k7
C536 68
R575 2k2
IC503 B 74HCT74
C537 N.C
R578 100
DZ503 4V7
R576 10K
BAS_SYNC
C535 100
R566 2k2

USB MODULE
Q506
Q507
Q508
Q509
J501
J502
J503
COM_INTER
SDA(3.5)
SCL(3.5)

(4) WIDTH
(3) TILT
(4) H_CENT
(3) G2_ADJ
(3) H_CONV
(3) V_CONV
R559 2k2
R514 2k2
R550 4k7
R535 4k7
R551 4k7
R549 1k
R548 1k
C528 2u2
C520 2u2
C509 2u2
C521 2u2
C523 2u2
C524 2u2
R505 12k
R512 4k7
C519 2u2

(1.2.4) UVLO
UVLO
R517 22k
Q510
-13V
5V
15V
R525 100k
T506 BC857
R527 100
R526 220
D504 LL4148
DZ502 3V9 2x
C515 1u 50V
R528 1k
12V

(1) DEMA
STBY_5V
R563 100
R504 1k
R501 1k
UP
DOWN
(1.2) SUSPEND
(1) POWER_OFF
STBY_5V
R584 10K
(2.3) V_SYNC

IC501 ST7275
DA0 DA1 DA2 DA3 DA4 DA5 DA6 DA7 DA8 VSSA VDDA PB7 PB6 PB5 PB4 PB3 PB2 PB1 PB0/VFBACK VSYNCI1 PD7/VSYNCI2/ITD PD6/CLMPO PD5/ITA PD4/ITB PD3/ITC PD2/VSYNCO PD1/HSYNCO PD0/CSYNCI
VPP/TEST IRIN NRESET PA0 PA1 PA2 PA3 PA4 PA5 PA6 PA7/BLANKOut OSCin OSCout NC NC NC NC PC7/TDO (SCI) PC6/RDI (SCI) PC5/SDAI PC4/SCLI PC3/SDAO (IDC) PC2/SCLO (IDC)/RX PC1/HSYNCI2 PC0/OCOMP/HFBACK VDD HSYNCI1 VSS

X501 24MHz
C517 15
R533 10M
C518 15
STBY_5V
R561 470K
R558 47K
R580 100
R581 100
SDA1(5)
SCL1(5)
LIN1(4)
LIN2(4)
STBY_5V
C516 10u
C502 47n
R562 4k7

R582 R536 R537 R539 R540 R541 7x2k7
R538
R542 7x4k7
S0(4)
T514 BCR141
BCR141 T515
BCR141 T516
T517 BCR141
STBY_5V
R543 S1(4)
R544 S2(4)
R545 S3(4)
R546 S4(4)
R547 S5(2.4)
R583 S6(2.4)
T511 BCR141
T512 BCR141
T513 BCR141
STBY_5V
(3.5) SDA
(3.5) SCL
R552 2k2
R553 2k2
STBY_5V
C529 100n
+5V A0 A1 A2 SCL SDA
IC504 X2404

STBY_5V
D508 LL4148
R518 100k
R532 4k7
R531 1k
C501 330
STBY_5V
D507 LL4148
R530 4k7
IC502 A 74HC14
C503 10n
C533 47

R529 470
STBY_5V
R567 10k
DZ501 N.C
V_FLB_TO_OSD
IC502 C 74HC14
H_FLB_TO_OSD
R569 100
IC502 E 74HC14
IC502 F 74HC14
R573 22k
C532 22
FLYBACK(2.4)
STBY_5V
C534 47
R572 4k7
R554 10k
IC502 D 74HC14
PULSE (4)
STBY_5V
R520 15k
BCL(3)
T508 BC847
R521 560
C551 220n
C553 10n
T509 BC857
C552 0u47

H_SYNC(2)
CONTRAST
BRIGHTNESS
INPUT SELECT
Q511
R577 100
C538 N.C
IC502 B 74HC14
STBY_5V
190V
80V
12V
7V
CLAMP
G1(2)
-13V
5V
Q501
Q502
SDA1(5)
SCL1(5)
SELF TEST
H.SYNC
V.SYNC
SCL(3.5)
SDA(3.5)
C.SYNC
Q503

PROCESSOR

ECN 446A23

445U	SMA226.SMA227		
445T	SMA224.SMA225	445Q	SMA228
446A	SMA217.SMA221		

56015

ECN 4450223
ECN 4451118

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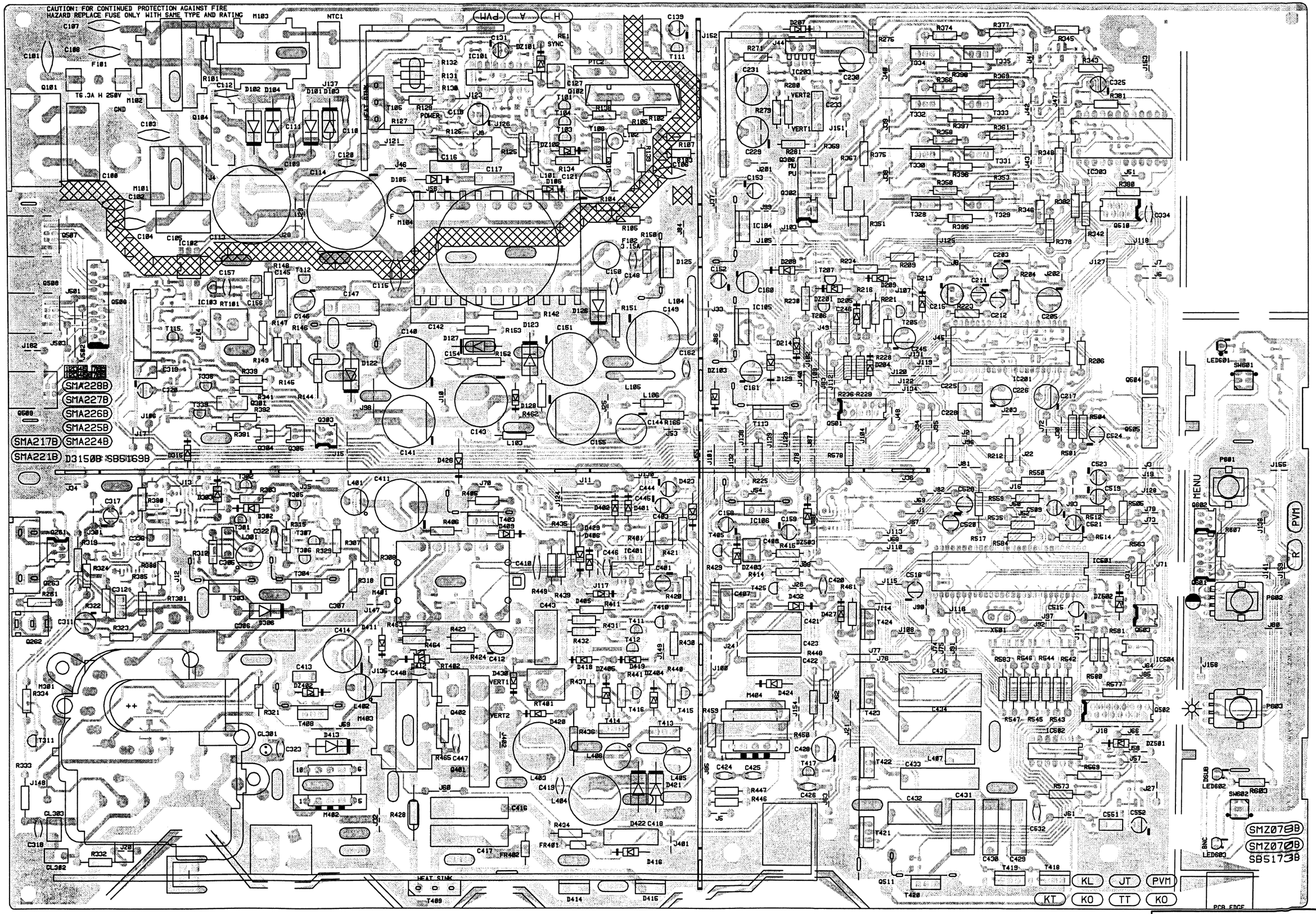
446A



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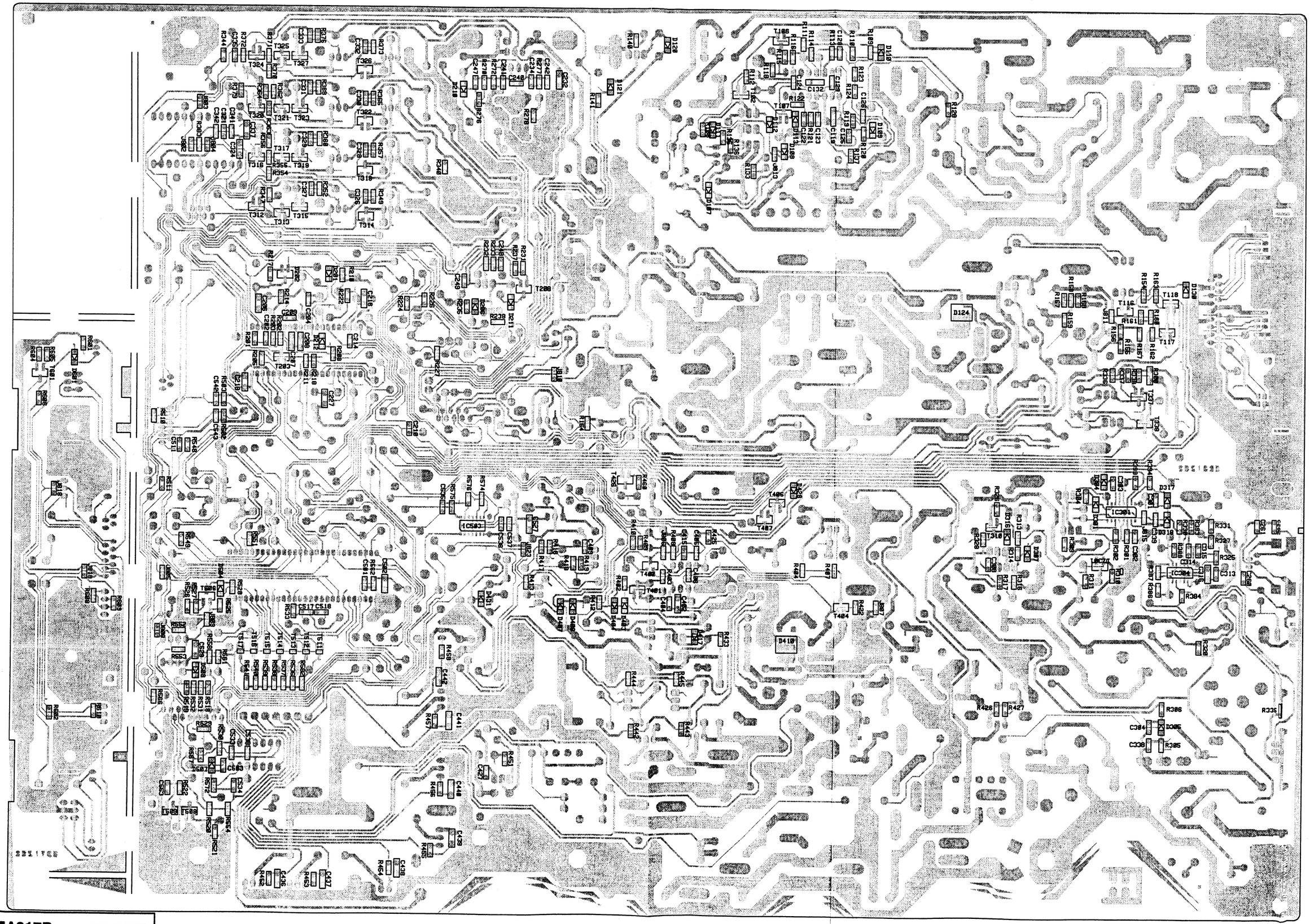

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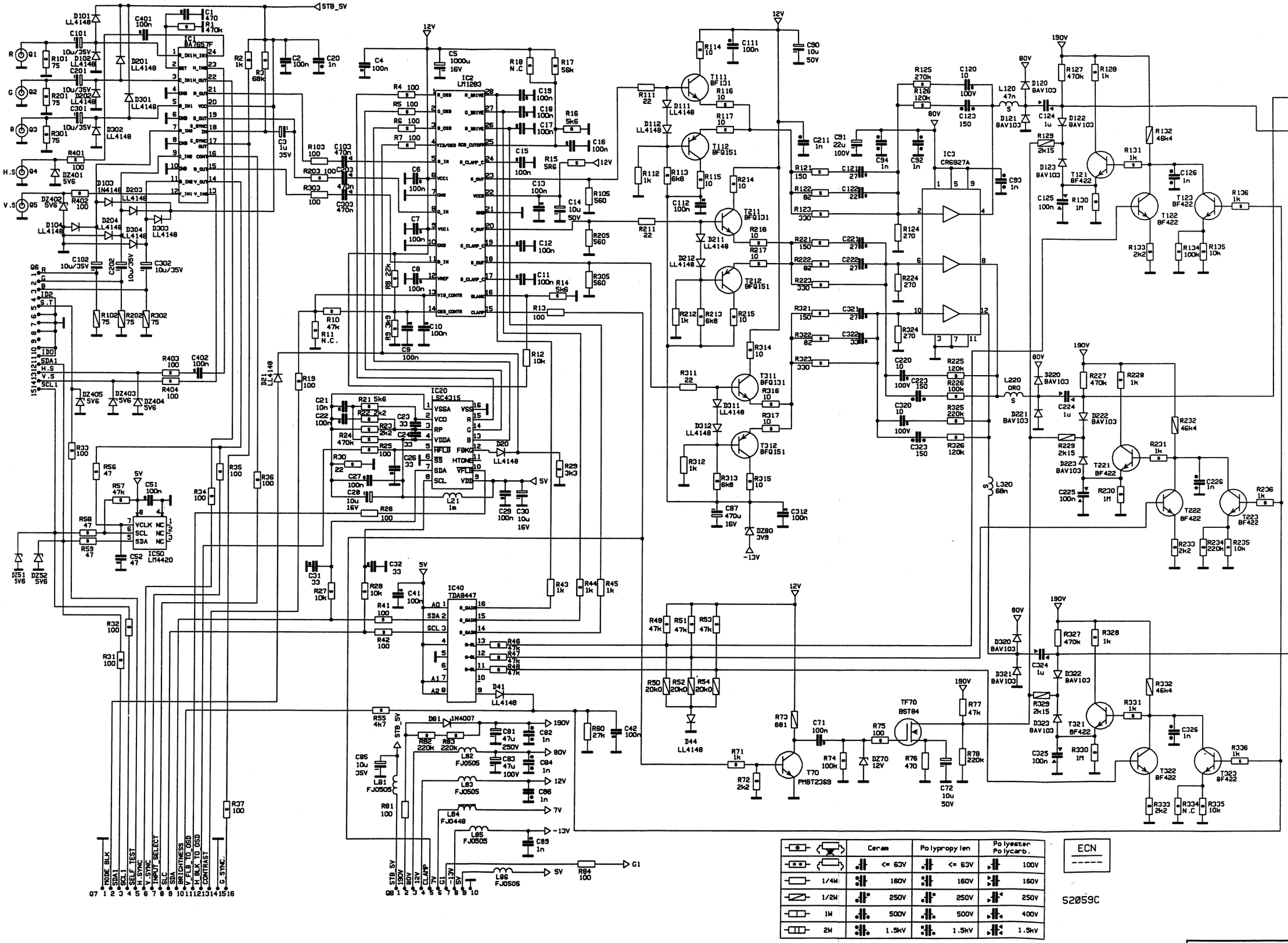

	Ceram	Polypropylen	Polyester Polycarb.
	<= 63V	<= 63V	100V
1/4W	160V	160V	160V
1/2W	250V	250V	250V
1W	500V	500V	400V
2W	1.5kV	1.5kV	1.5kV

ECN

52059C

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Part Number	Description	PG	Item Number
AA0633	CF RES 0W25 22R J 2,5-7	1	RY 111 211 311
AA0649	CF RES 0W25 100R J 2,5-7	1	RY 013 026 081 084 103 303
AA0659	CF RES 0W25 270R J 2,5-7	1	RY 124 224 324
AA0665	CF RES 0W25 470R J 2,5-7	1	RY 076
AA0667	CF RES 0W25 560R J 2,5-7	1	RY 105 205 305
AA0673	CF RES 0W25 1K0 J 2,5-7	1	RY 043 045 112 212 312
AA0697	CF RES 0W25 10K J 2,5-7	1	RY 012
AA0707	CF RES 0W25 27K J 2,5-7	1	RY 060
AA0713	CF RES 0W25 47K J 2,5-7	1	RY 077
AA0729	CF RES 0W25 220K J 2,5-7	1	RY 078
AA0737	CF RES 0W25 470K J 2,5-7	1	RY 127 227 327
AC3453	CHIPRES 47K5 0W1 1% 0805	1	RY 046 047 048 049 051 053
AC3584	CHIPRES 0W1 75R 1% 0805 2013	1	RY 101 201 301
AC4419	CHIPRES 0W1 5R6 5% 0805 2013	1	RY 015
AC4425	CHIPRES 0W1 10R 5% 0805 2013	1	RY 114 115 116 117 214 215 216 217 314 315
AC4425	CHIPRES 0W1 10R 5% 0805 2013	1	RY 316 317
AC4433	CHIPRES 0W1 22R 5% 0805 2013	1	RY 030
AC4441	CHIPRES 0W1 47R 5% 0805 2013	1	RY 322
AC4441	CHIPRES 0W1 47R 5% 0805 2013	1	RY 056 058 059
AC4447	CHIPRES 0W1 82R 5% 0805 2013	1	RY 122 222
AC4449	CHIPRES 0W1 100R 5% 0805 2013	1	RY 004 005 006 007 019 025 203 031 032
AC4449	CHIPRES 0W1 100R 5% 0805 2013	1	RY 033 034 035 036 037 041 042 075 401 402
AC4449	CHIPRES 0W1 100R 5% 0805 2013	1	RY 403 404
AC4453	CHIPRES 0W1 150R 5% 0805 2013	1	RY 121 221 321
AC4461	CHIPRES 0W1 330R 5% 0805 2013	1	RY 123 223 323
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	1	RY 044 071 128 131 136 002 228 231 236
AC4473	CHIPRES 0W1 1K0 5% 0805 2013	1	RY 328 331 336
AC4481	CHIPRES 0W1 2K2 5% 0805 2013	1	RY 022 072 133 233 333 023
AC4485	CHIPRES 0W1 3K3 5% 0805 2013	1	RY 029
AC4487	CHIPRES 0W1 3K9 5% 0805 2013	1	RY 009
AC4489	CHIPRES 0W1 4K7 5% 0805 2013	1	RY 055
AC4491	CHIPRES 0W1 5K6 5% 0805 2013	1	RY 014 016 021
AC4493	CHIPRES 0W1 6K8 5% 0805 2013	1	RY 113 213 313
AC4497	CHIPRES 0W1 10K 5% 0805 2013	1	RY 135 235 335 027 028
AC4505	CHIPRES 0W1 22K 5% 0805 2013	1	RY 008
AC4509	CHIPRES 0W1 33K 5% 0805 2013	1	RY 011
AC4513	CHIPRES 0W1 47K 5% 0805 2013	1	RY 010 057
AC4515	CHIPRES 0W1 56K 5% 0805 2013	1	RY 017
AC4517	CHIPRES 0W1 68K 5% 0805 2013	1	RY 003
AC4521	CHIPRES 0W1 100K 5% 0805 2013	1	RY 074 134
AC4523	CHIPRES 0W1 120K 5% 0805 2013	1	RY 126 225 226 326
AC4529	CHIPRES 0W1 220K 5% 0805 2013	1	RY 082 083 234 325
AC4531	CHIPRES 0W1 270K 5% 0805 2013	1	RY 125
AC4537	CHIPRES 0W1 470K 5% 0805 2013	1	RY 001 024
AC8745	CHIPRES 0W12 1M0 J 1206 3216	1	RY 130 230 330
AC8799	CHIPRES 0W12 0R0 JUMPER 1206	1	LY 120 320
AC8799	CHIPRES 0W12 0R0 JUMPER 1206	1	LY 220
AG3285	MF RES 0W5 75R0 F TC50 2,5-7	1	RY 102 202 302
AG3381	MF RES 0W5 681R F TC50 2,5-7	1	RY 073
AG3433	MF RES 0W5 2K15 F TC50 2,5-7	1	RY 129 229 329
AG3557	MF RES 0W5 38K3 F TC50 2,5-7	1	RY 050 052 054
AG3565	MF RES 0W5 46K4 F TC50 2,5-7	1	RY 132 232 332
CB3133	CHIPCERCAP NP0 22P 50V J 0805	1	CY 122
CB3135	CHIPCERCAP NP0 27P 50V J 0805	1	CY 121 221 321 222
CB3137	CHIPCERCAP NP0 33P 50V J 0805	1	CY 023 024 026 031 032 322
CB3141	CHIPCERCAP NP0 47P 50V J 0805	1	CY 052

Part Number	Description	PG	Item Number
CB3167	CHIPCERCAP NP0 470P 50V J 0805	2	CY 001
CB3175	CHIPCERCAP NP0 1N0 50V J 0805	3	CY 089
CB3639	CHIPCERCAP NPO 10P 100V J 0805	1	CY 120 220 320
CC0110	CERCAP Y5P 150P K 500V Y5: D8	1	CY 123 223 323
CC0200	CERCAP Y5P 1N0 K 500V Y5: D9	1	CY 082 084 092 094 126 226 326 093
CC0204	CERCAP Y5P 1N0 K 50V Y5: D6	1	CY 086 020 211
CC0853	CERCAP Z5V 100N Z 25V Y5: D9	1	CY 111
CC3320	CHIPCERCAP X7R 10N 10% 50V 0805	1	CY 021
CC3480	CHIP CERCAP X7R 10% 100N 25V 0805	2	CY 002 004 006 007 008 009 010 011 012 013
CC3480	CHIP CERCAP X7R 10% 100N 25V 0805	2	CY 015 016 017 018 019 022 027 029 041 042
CC3480	CHIP CERCAP X7R 10% 100N 25V 0805	2	CY 071 312 401 402 112 051
CK0283	PESCAP MKT 100N K 250V Y5 070812	2	CY 125 225 325
CK0465	PESCAP MKT 1U0 K 250V Y15 091818	4	CY 124 224 324
CK2784	PESCAP MKT 470N K 63V Y5: 051008	3	CY 103 203 303
CN0308	ELCAP 10U M 50V RM5 : 6*12	1	CY 101 102 201 202 301 302
CN0379	ELCAP' 22U M 100V RM5 :105'11*14	2	CY 091
CN2017	ELCAP 1U0 M 50V RM5: 105' 6X12	2	CY 003
CN2032	ELCAP 10U M 50V RM5: 105' 6X12	1	CY 085 014 028 030 072 090
CN2461	ELCAP- 47U M 100V RM5 105, 10X16	4	CY 083
CN2476	ELCAP 47U M 250V RM7,5 105'17X26	9	CY 081
CN2642	ELCAP 470U M 16V RM5: 105' 11X21	4	CY 087
CN2712	ELCAP 1000U M 16V RM5: 105'11X21	5	CY 005
FA2014	CHIP COIL 680NH 10% SIZE 0805	5	LY 001
FJ0448	CHOKE 13UH FERRITE 2X15	2	LY 084
FJ0505	CHOKE 15UH 5% TAPED AXIAL	2	LY 081 082 083 085 086
FJ0516	CHOKE 1MH 5% TAPED AXIAL	2	LY 021
JF0025	DI 1N4148 75V 200MA 4N	1	DY 103
JF0067	DI 1N4007 1000V 1A	1	DY 081
JF4003	DI BAV103 200V 250MA 50NS SOD-80	7	DY 120 121 122 123 220 221 222 223 320 321
JF4003	DI BAV103 200V 250MA 50NS SOD-80	7	DY 322 323
JF4005	DI LL4148 75V 150MA 4N (JF4006)	1	DY 020 021 041 044 101 102 104 111 112 201
JF4005	DI LL4148 75V 150MA 4N (JF4006)	1	DY 202 203 204 211 212 301 302 303 304 311
JF4005	DI LL4148 75V 150MA 4N (JF4006)	1	DY 312
JH0053	ZDI BZX83C5V6 5.6V 0.5W 5%	1	DZY 401 402 403 404 405 051 052
JH0054	ZDI BZX83C12 12V 0.5W 5%	1	DZY 070
JH0081	ZDI ZPY 3.9 3.9V 1.3W 5%	1	DZY 080
JM0244	TR BF422 N 250V 25MA 60M:	2	TY 121 122 123 221 222 223 321 322 323
JM0354	TR BFQ131 N 18V 150MA 4GHZ SOT54	4	TY 111 211 311
JM0355	TR BFQ151 P 15V 100MA 3.5G SOT54	5	TY 112 212 312
JM4116	TR PMBT2369 N 15V 200MA SOT-23	3	TY 070
JM4305	TR BST84 N 200V 250MA 250MS SOT89	12	TFY 070
LM0943	IC LM1283N 140MHZ RGB AMP W/OSD	16	ICY 002
LM0961	IC LSC4386P2 OSD WITH OWN CHAR.	21	ICY 020
LM0963	IC CR6927A 150MHZ 3-CH CRT DRIVER	29	ICY 003
LM0968	IC TDA8447 12C BUS 8BIT DAC DIL16	12	ICY 040
LM4420	IC DUAL MODE EEPROM FOR DDC 2.0	12	ICY 050
LM4421	IC BA7657F INPUT SIGNAL SELECTOR	13	ICY 001
QK1522	HIGH DENSITY D-15 CONN. FEM VERT	13	QY 006
QK1562	BNC-CONN FEMALE VERT 75OHM PCB	11	QY 001 002 003 004 005
QK1704	PICOFLEX HEADER 1X10 1,27MM	4	QY 008
QK1707	PICOFLEX HEADER 1X16 1,27MM	4	QY 007
QK1705	PICOFLEX HEADER 1X12 1,27MM	4	QY 009
UC6869	J__HD.LEVY/COOLING PLATE 447S	6	ICY 003
WN0168	RIWSCREW 1712-3510	3	ICY 003
XW0032	L_MP.JOHT.RASVA DOW CORNING	9	ICY 003

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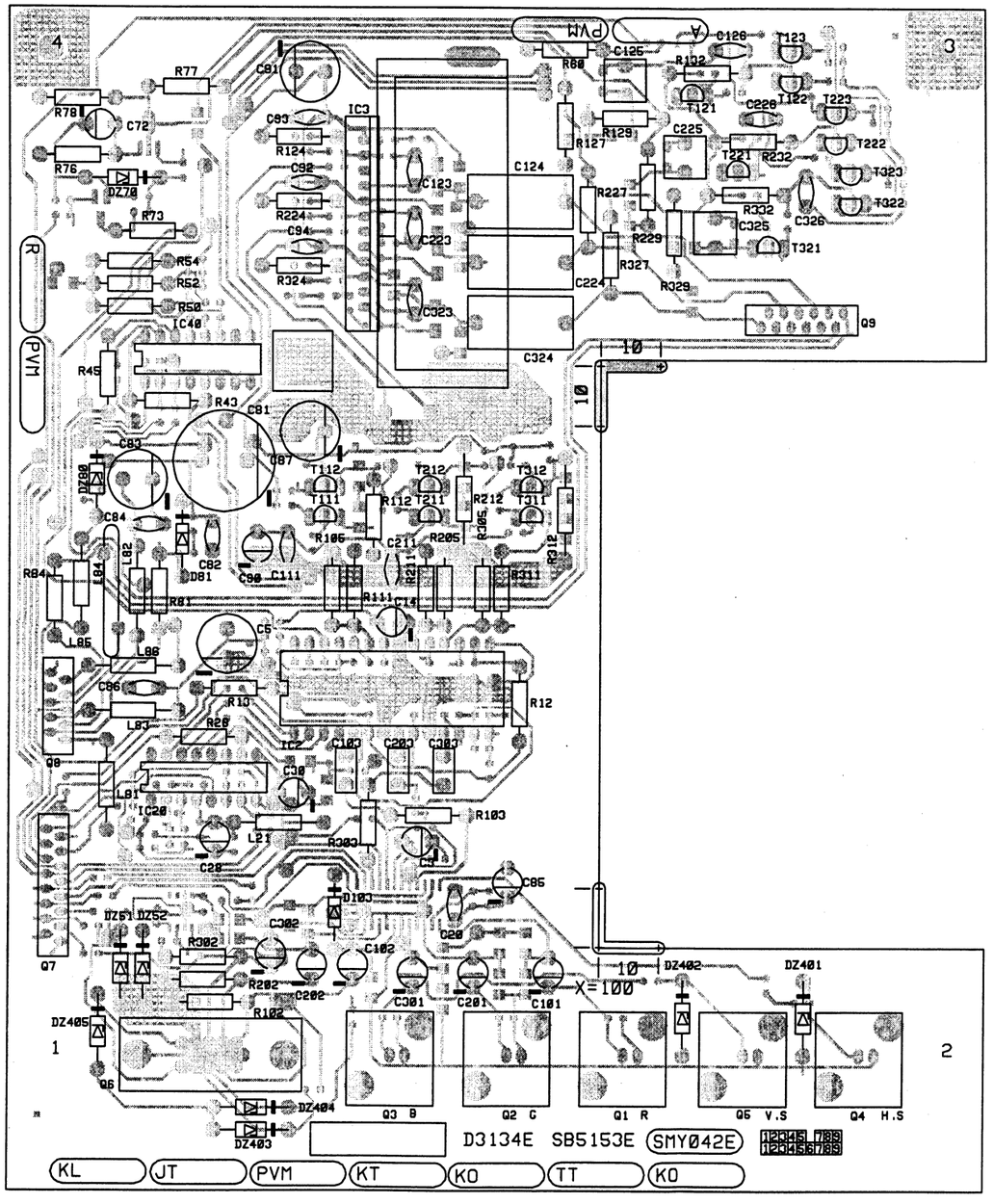

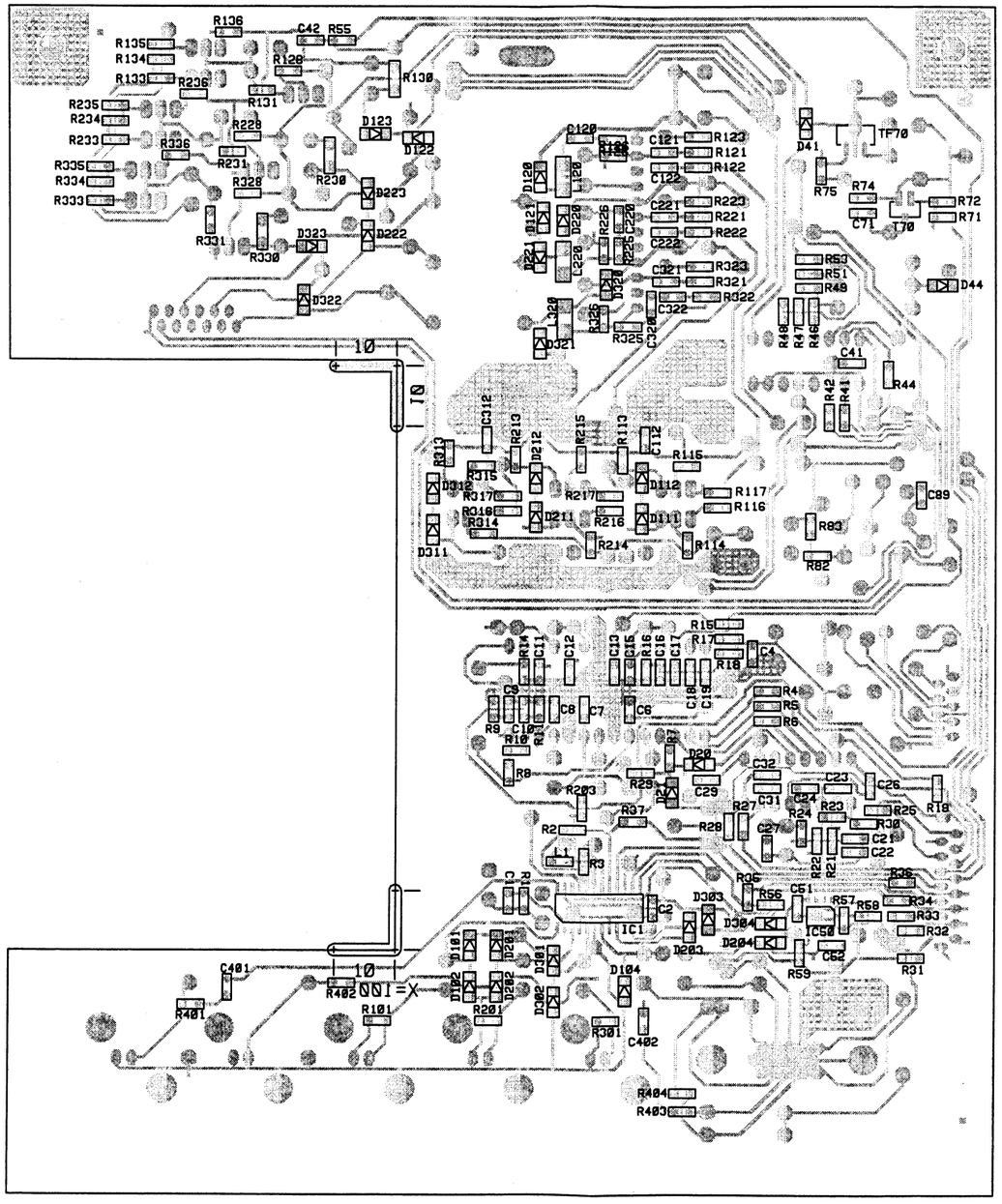

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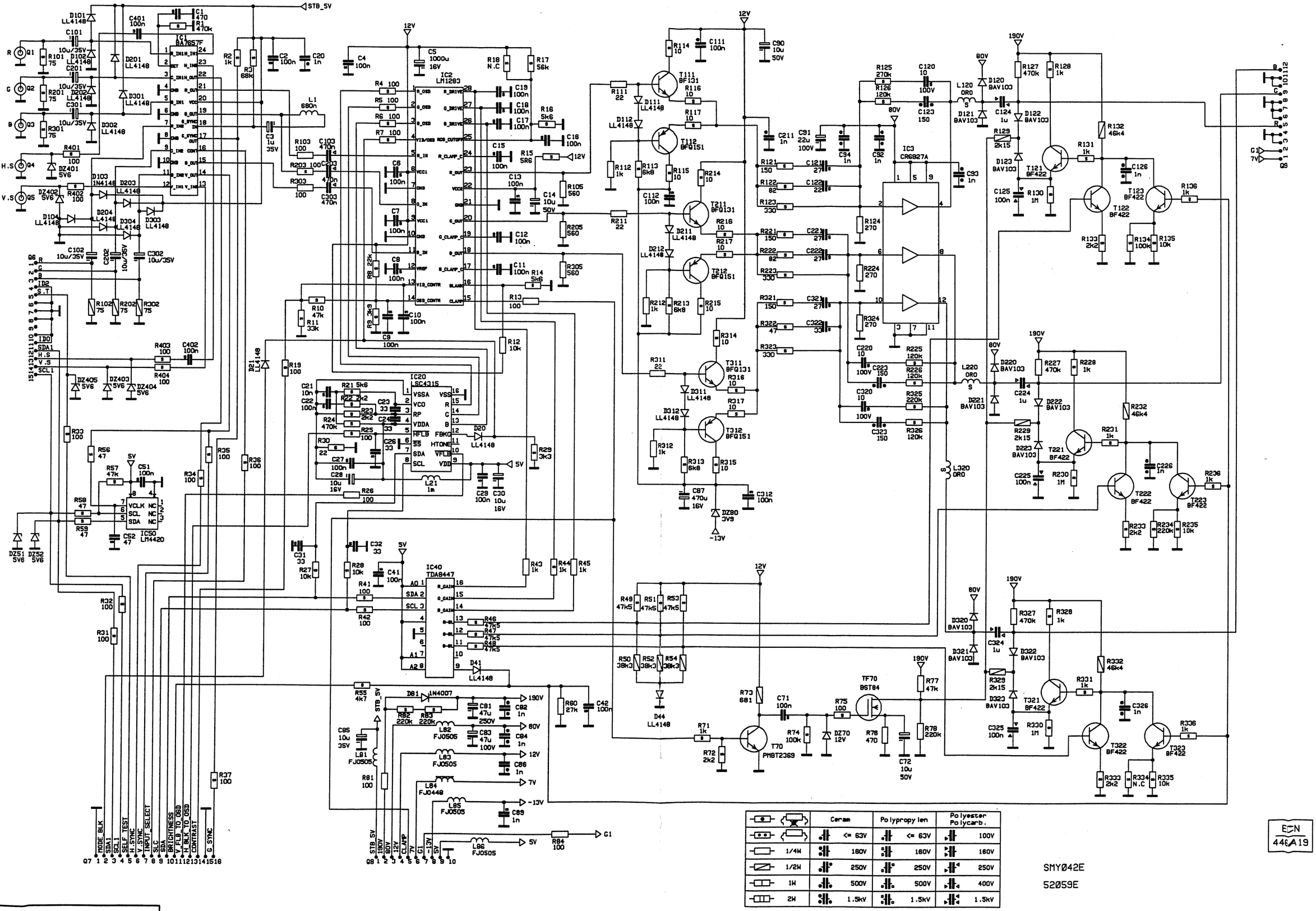

	Ceram	Polypropylen	Polyester Polycarb.
	<= 63V	<= 63V	100V
1/4W	160V	160V	160V
1/2W	250V	250V	250V
1W	500V	500V	400V
2W	1.5kV	1.5kV	1.5kV

SMY042E

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